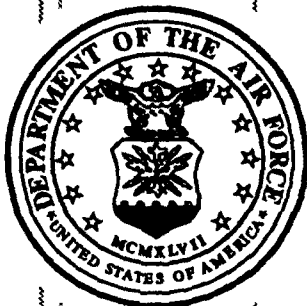
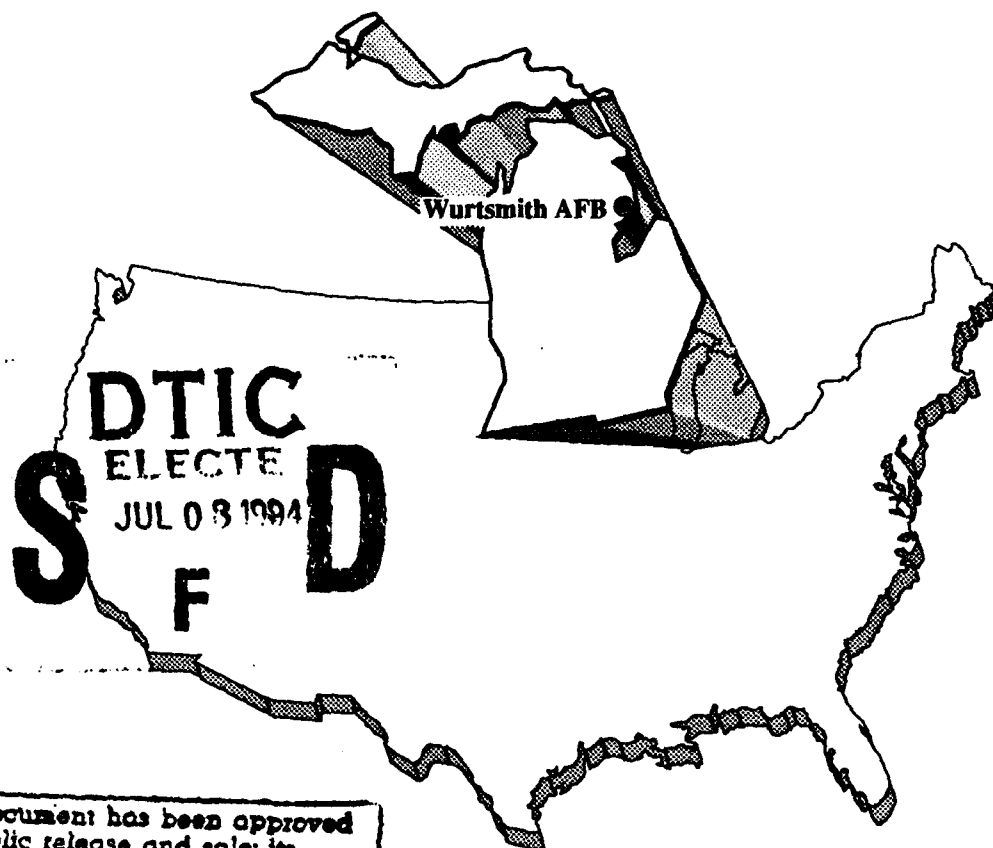


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SOCIOECONOMIC IMPACT ANALYSIS  
STUDY  
March 1993



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DISPOSAL AND REUSE OF  
WURTSMITH AIR FORCE BASE, MICHIGAN

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# **SOCIOECONOMIC IMPACT ANALYSIS STUDY**

## **DISPOSAL AND REUSE OF WURTSMITH AIR FORCE BASE, MICHIGAN**

**MARCH 1993**

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## SUMMARY

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Wurtsmith Air Force Base (AFB), Michigan, was one of the bases recommended by the 1991 Defense Base Closure and Realignment Commission for closure. The Commission's recommendations were accepted by the President and submitted to Congress on July 12, 1991. As Congress did not disapprove the recommendations in the time given under the Defense Base Closure and Realignment Act (DBCRA) of 1990 (Public Law [P.L.] 101-510, Title XXIX), the recommendations have become law.

DBCRA requires the Secretary of Defense to comply with the National Environmental Policy Act (NEPA) in the implementation of the base closures and realignments. The Secretary of Defense, through the Air Force, is preparing the required NEPA documents for the base disposal. Consideration of closure is exempted under DBCRA because that decision is final under the statute. The *Environmental Impact Statement (EIS) for the Disposal and Reuse of Wurtsmith AFB* analyzes environmental effects of the disposition of the base and its reuse under alternative redevelopment plans.

This *Socioeconomic Impact Analysis Study* addresses the socioeconomic effects of closure and potential reuse of the base. This document is designed to provide assistance to local governments and redevelopment agencies in the development of their reuse plan. The scope of this study includes economic activity, population, housing, public services, public finance, transportation, and utilities. This document is not required by NEPA.

The primary mission of Wurtsmith AFB was to provide a home for the 379th Bombardment Wing, including the 920th Refueling Squadron, the 2030th Communications Squadron, Detachment 28 of the 26th Weather Squadron, Detachment 14 of the 3904th Management Engineering Squadron, Detachment 224 of the 3753rd Field Training Squadron, and the 71st Flying Training Wing. The transfer and consolidation of these Air Force activities to other Air Force bases in the United States has been initiated. The base contains an airfield, aviation support areas, a hospital, residential areas, an education center, commercial, industrial, and public facilities/recreation areas.

If the base is placed in caretaker status and not reused for other purposes, most or all of the "mothballed" facilities would be restricted from access. Security and minimal maintenance activities would provide only limited employment opportunities on the base. A total of 50 direct and 11 secondary jobs would be required to maintain the premises. This closure and caretaker scenario serves as the closure baseline and No-Action Alternative for this study.

Wurtsmith AFB is located in Iosco County, about 140 miles north of Detroit in the northeastern portion of Michigan's lower peninsula, about 2 miles from the western shore of Lake Huron. The base encompasses 4,626 acres and is located entirely within the boundaries of Oscoda Township. The real estate portion owned unconditionally by the Air Force comprises 12 percent (568 acres) of the base land. The remaining 88 percent (4,058 acres) of base land (non-fee-owned property) currently controlled by the Air Force has been acquired for limited durations from numerous individuals and agencies, including the state of Michigan and the U.S. Forest Service. The Air Force must surrender its limited rights to this property when the land is no longer needed for military purposes and after all legal obligations relating to the Air Force's use of the property have been satisfied.

A four-county area (Alcona, Alpena, Arenac, and Iosco) was initially considered the region of influence (ROI) for the purposes of describing and analyzing the socioeconomic effects. The ROI was then refined for each issue area as appropriate (see Section 2.2).

In the absence of any reuse of the base, population in the ROI would decline from 85,890 in 1990 to 78,139 at closure in June 1993. Over the next 20 years, the population in the ROI would increase slowly, to approximately 82,900 by 2013, based upon state of Michigan population projections.

This report analyzes the socioeconomic effects of three conceptual plans involving reuse of the base by private and public entities. All plans are compared to projected post-closure conditions without reuse during the 20 years following base closure and, as appropriate, to preclosure conditions. The alternative plans are the Proposed Action, Fire Training Alternative, and Recreation Alternative.

**Proposed Action.** Major land use components in the Proposed Action include an airfield, public/recreation, existing residential, light industrial, and aviation support. The airfield (1,025 acres) and public facilities/recreation areas (2,274 acres) comprise about 75 percent of the proposed land use. Institutional (medical), commercial, and convention/tourist uses constitute the remainder of the uses proposed.

**Fire Training Alternative.** Major land use components in the Fire Training Alternative include public and private institutional education, public facilities/recreation, and existing residential. The institutional education (3,127 acres) and public facilities/recreation areas (885 acres) comprise about 87 percent of the proposed land use. Industrial, institutional (medical), and commercial uses constitute the remainder of the uses proposed.

**Recreation Alternative.** The major land use component of the Recreation Alternative, which is public facilities/recreation (4,219 acres), comprises



about 90 percent of the proposed land use. Commercial, industrial, educational, and residential uses constitute the remainder of the uses proposed.

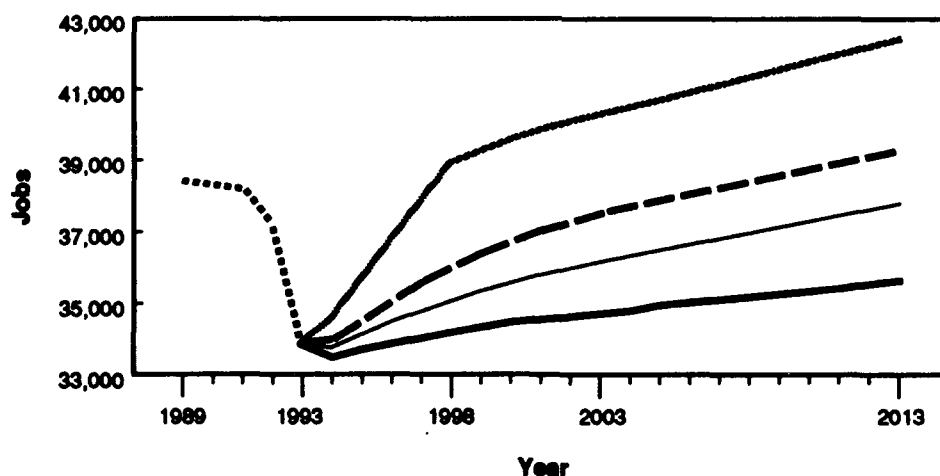
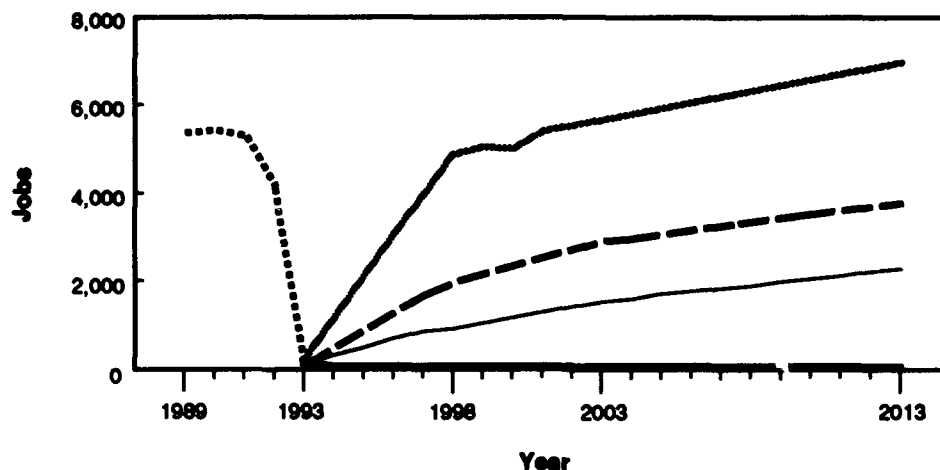
The net effects of reuse on the communities in the vicinity of Wurtsmith AFB would vary with the reuse alternative implemented. The net effects are the total direct and secondary employment and population decreased by the Operating Location (No-Action Alternative) personnel. Figures S-1 and S-2 illustrate the projected profile of changes in future employment and population within the ROI for each of the reuse alternatives and the No-Action Alternative. Key findings of this study include the following:

- Under the Proposed Action, 4,285 direct jobs are projected by the year 2013, with an additional 2,582 secondary jobs. It is estimated that population would increase in response to these employment opportunities by 8,352 by the year 2013. Fiscal shortfalls due to base closure would be reversed for most of the jurisdictions studied with the exception of Oscoda Area Schools, where the loss of P.L. 81-874 funding of about \$2.2 million would not be offset by increases in other revenue sources.
- The Fire Training Alternative would generate 2,498 direct and 1,191 secondary jobs by the year 2013, approximately 60 percent of the effects of the Proposed Action. Population is projected to increase in response to these employment opportunities by 4,749 by that same year. Similar to the Proposed Action, fiscal shortfalls would be reversed for most of the jurisdictions, although this would occur at a later date during the development process. Oscoda Area Schools, however, would remain in a deficit condition of about \$2.2 million due to the loss of P.L. 81-874 program revenues.
- The Recreation Alternative would generate 1,473 direct and 712 secondary jobs by the year 2013, approximately 35 percent of the effects associated with the Proposed Action. Population is projected to increase in response to these employment opportunities by 2,835 by 2013. Alcona County fiscal shortfalls would be reversed, although Oscoda Area Schools would still be in a deficit condition of about \$2.2 million due to the loss of P.L. 81-874 program revenues.

Under the No-Action Alternative, the U.S. Government would retain ownership of the Air Force fee-owned property after base closure. Non-fee-owned property would return to the lessee upon mutually agreed termination of the lease. The base would be in caretaker status and minimally maintained. A total of 50 direct jobs and 11 secondary jobs would be generated by these caretaker activities.

ALTERNATIVE	1993 <sup>(a)</sup>	1998	2003	2013
Proposed Action	61	4,781	5,607	6,867
Fire Training	61	1,878	2,789	3,689
Recreation	61	845	1,450	2,185
No-Action	61	0	0	0

Reuse-Related  
Employment  
Effects



#### EXPLANATION

- ..... Preclosure
- Proposed Action
- Fire Training Alternative
- Recreation Alternative
- No-Action Alternative

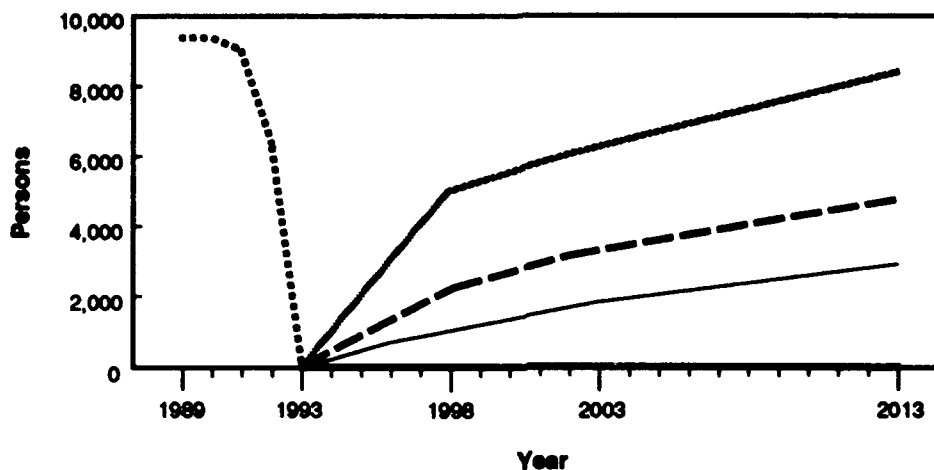
#### Reuse-Related Employment Effects

(a) The 1993 values represent total base-related employment under the closure baseline.  
 (b) Employment effects represent the change in employment relative to the No-Action Alternative.

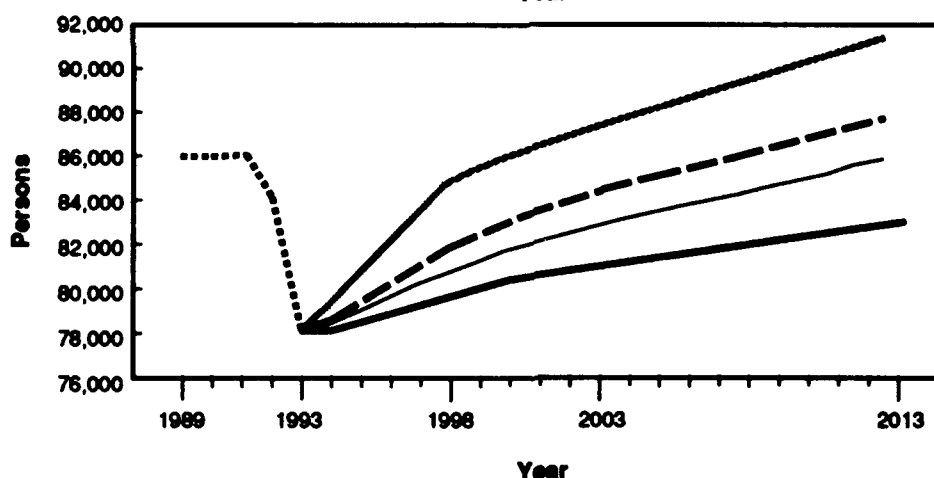
Figure S-1

ALTERNATIVE	1993	1998	2003	2013
Proposed Action	0	5,002	6,203	8,352
Fire Training	0	2,148	3,275	4,749
Recreation	0	977	1,736	2,835
No-Action	0	0	0	0

**Migratory-Related  
Population  
Effects**



**Migratory-Related  
Population  
Effects**



**Total ROI  
Population  
Including  
Reuse  
Effects**

#### EXPLANATION

- ..... Preclosure
- Proposed Action
- Fire Training Alternative
- Recreation Alternative
- No-Action/Post-Closure

#### Migratory-Related Population Effects

Note: Migratory-related population effects are the persons that would move into the ROI solely as a result of reuse.

**Figure S-2**

**Table S-1 summarizes the comparative findings of this study for each issue area and each alternative after 20 years. The table also displays findings for the No-Action Alternative to provide a benchmark for assessing the effects of a particular alternative relative to closure conditions.**

**Table S-1. Comparison of Reuse Alternatives**  
Page 1 of 2

Resource	No-Action/Caretaker Status	Change from No-Action Alternative		
		Proposed Action	Fire Training Alternative	Recreation Alternative
Economic Activity <sup>(a)</sup>				
Regional Employment	61 jobs	6,867 jobs	3,689 jobs	2,185 jobs
Regional Earnings (\$1989)	\$1,199,000/year	\$160,761,000/year	\$75,817,000/year	\$46,556,000/year
Population	Zero effect	8,352 people	4,749 people	2,835 people
Housing	Zero demand	2,870 units	1,633 units	976 units
Public Services				
General Government, Police, and Fire				
Iosco County	Minimal added demand for services	5,195 additional persons served	2,964 additional persons served	1,770 additional persons served
Township of Oscoda	Minimal added demand for services	3,157 additional persons served	1,805 additional persons served	1,078 additional persons served
Township of Au Sable	Minimal added demand for services	1,150 additional persons served	657 additional persons served	392 additional persons served
Alcona County	Minimal added demand for services	2,680 additional persons served	1,530 additional persons served	913 additional persons served
Township of Greenbush	Minimal added demand for services	815 additional persons served	466 additional persons served	278 additional persons served
Education	Zero enrollments	1,484 students in Oscoda Area Schools, 142 in Tawas Area Schools	848 students in Oscoda Area Schools, 80 in Tawas Area Schools	506 students in Oscoda Area Schools, 48 in Tawas Area Schools
Health Care	Wurtsmith AFB hospital closed	Civilian clinic open	Civilian clinic open	Civilian clinic open

Notes: (a) All effects presented in this table apply specifically to the year 2013 but may be interpreted as long-duration effects that extend indefinitely beyond 2013. Economic activity, as shown, is based upon site-related demands. Population, housing, public services, and public finance are based upon migratory-related demands.

(b) Projected shortfalls assume there are no offsetting changes in revenues or service delivery standards.

Table S-1. Comparison of Reuse Alternatives  
Page 2 of 2

Resource	Change from No-Action Alternative		
	No-Action/Caretaker Status	Proposed Action	Fire Training Alternative Recreation Alternative
<b>Public Finance<sup>(a)</sup></b>			
Iosco County	Shortfalls to \$529,469/year	Positive; shortfalls offset by Fiscal Year 2009	Shortfalls to \$99,940 by Fiscal Year 2013
Township of Oscoda	Shortfalls to \$238,702/year	Positive; shortfalls offset by Fiscal Year 1998	Positive; shortfalls offset by Fiscal Year 2003
Township of Au Sable	Shortfalls to \$30,207/year	Positive; shortfalls offset by Fiscal Year 2000	Shortfalls to \$2,272 by Fiscal Year 2013
Alcona County	Shortfalls to \$44,787/year	Positive; shortfalls offset by Fiscal Year 1996	Positive; shortfalls offset by Fiscal Year 2000
Township of Greenbush	Shortfalls to \$9,055/year	Positive; shortfalls offset by Fiscal Year 1997	Positive; shortfalls offset by Fiscal Year 2003
Oscoda Area Schools	Shortfalls to \$2,187,796/year	Shortfalls to \$2,210,167 by Fiscal Year 2013	Shortfalls to \$2,200,786 by Fiscal Year 2013
Tawas Area Schools	Shortfalls to \$33,067/year	Positive; shortfalls offset by Fiscal Year 1997	Positive; shortfalls offset by Fiscal Year 2004
<b>Other Relevant Resources</b>			
Transportation	Base-related traffic reductions on local roads; some offset by projected changes in area population	Substantial traffic increases on local roads due to development of residential, industrial, institutional, commercial, and aviation activities	Substantial traffic increases on local roads due to development of recreational, industrial, institutional, and commercial activities
Utilities	Projected demand for water, wastewater treatment, solid waste disposal, and energy 35 to 60 percent lower than preclosure levels	Increased demand for utilities approximating preclosure projections	Increased demand for utilities much less than preclosure projections

Notes: (a) All effects presented in this table apply specifically to the year 2013 but may be interpreted as long-duration effects that extend indefinitely beyond 2013. Economic activity, as shown, is based upon site-related demands. Population, housing, public services, and public finance are based upon migratory-related demands.

(b) Projected shortfalls assume there are no offsetting changes in revenues or service delivery standards.

Wurtsmith AFB Disposal and Reuse SIAS

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## **1.0 INTRODUCTION**

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Chapter 1 presents the purpose of this study, briefly discusses the reason for and nature of the closure of Wurtsmith Air Force Base (AFB), reviews results of previous base closures, and defines the potential reuse alternatives in terms relevant to the analysis of socioeconomic effects.

This report is organized to provide an assessment of the socioeconomic characteristics and effects of base operation; the effects of alternative site reuse plans on the region; and the post-closure conditions for activities related to the site assuming the base remains in caretaker status and is not redeveloped. The remainder of the report is structured as follows:

Chapter 2 defines the region of influence (ROI) and provides the current community setting and profile of personnel, payrolls, and activities at the base.

Chapter 3 establishes the preclosure reference and closure conditions for the area at base closure and assumes the base will remain in caretaker or "mothballed" status.

Chapter 4 evaluates the effects of alternative reuse plans and compares them to the post-closure conditions without reuse.

### **1.1 PURPOSE OF THE STUDY**

The *Socioeconomic Impact Analysis Study* (SIAS) focuses on the socioeconomic effects resulting from the closure and potential reuse of Wurtsmith AFB. The scope of issues addressed includes economic activity, population, housing, and other major issues of local concern, such as public services, public finance, transportation, and utilities. These factors substantially influence the character of communities in the vicinity of the base, and are important to local residents. The analysis of these issues is intended to provide local planning officials with the necessary information with which to plan for changes at Wurtsmith AFB. The SIAS is not a National Environmental Policy Act (NEPA) document.

The *Environmental Impact Statement* (EIS) for *Disposal and Reuse of Wurtsmith AFB* analyzes the environmental issues associated with disposal of the base and its reuse under a range of potential redevelopment plans. The EIS was initiated to fulfill NEPA requirements which apply to federal actions, such as the decision for final disposition of Wurtsmith AFB. Socioeconomic factors are addressed within the EIS only from the perspective of their potential effect on the biophysical environment.

For instance, changes in economic activity, particularly in regional spending and employment, may lead to changes in area population, public service demand, and vehicular traffic on the area's road network. These effects, in turn, have the potential for beneficial or adverse environmental consequences on land use, air quality, water quality, noise, and biological and cultural resources.

## **1.2 CLOSURE OF WURTSMITH AFB**

In light of the changing international political scene and the resultant shift toward a reduction in defense spending, the Department of Defense (DOD) must realign and draw down its forces. The Department of the Air Force has been tasked under the Defense Base Closure and Realignment Act (DBCRA) of 1990 (Public Law [P.L.] 101-510, Title XXIX) to identify the facilities, properties, and installations that are no longer essential to support the limited force structure authorized by Congress. The Secretary of Defense then provided DOD closure and realignment recommendations to the Defense Base Closure and Realignment Commission formed as a result of the DBCRA.

The 1991 Defense Base Closure and Realignment Commission recommended a list of military bases for closure or realignment that was accepted by the President and submitted to Congress on July 12, 1991. This recommended closure and realignment list was not disapproved by Congress *within the time given under the statute to do so*. Therefore, under DBCRA, the recommendations have become law. As Wurtsmith AFB was on the Commission's list, the decision to close the base is final. Wurtsmith AFB is scheduled to close in June 1993.

Therefore, the Air Force plans to dispose of excess and surplus real property and facilities at Wurtsmith AFB. The disposal will be through transfer to another federal agency, public benefit conveyance to an eligible entity, negotiated sale to a public body, and/or sealed bid or auction to the general public. This disposal will be in compliance with the Federal Property and Administrative Services Act of 1949, the Surplus Property Act of 1944, and the DBCRA, which delegated to the Secretary of the Air Force many of the disposal powers of the Administrator of the General Services Administration.

The closure action involves consolidation of Air Force activities and personnel transfers from Wurtsmith AFB to other Air Force bases in the United States or a reduction in military forces through retirement of weapon systems and reducing military manpower levels (Defense Secretary's Commission on Base Realignment and Closure, 1991).

The projected post-closure conditions identified for this study occur once the base has gone into "caretaker status" after the phase-down of residual operations at the base and its subsequent closure. Caretaker status

includes provision of security and limited maintenance to keep base facilities in "mothballed" condition.

Analysis of this projected closure scenario, referred to as the No-Action Alternative, provides an assessment of near-term and long-term conditions in communities near the base with the base no longer in operation. This provides a benchmark for comparison of the socioeconomic consequences of alternative reuse plans.

### **1.3 PREVIOUS BASE CLOSURES**

Because of the potential for severing long-standing social and economic relationships, base closures can be a very disrupting experience for host communities. The future state of the local economy is always of concern, although many communities affected by base closures have successfully implemented installation reuse plans. A recent study completed by the President's Economic Adjustment Committee indicates that opportunities exist for successful conversion of military installations to civilian use (U.S. Department of Defense, Office of Economic Adjustment, 1990).

Included in the study was a review of the experiences of nearly 100 communities that lost a local military base between 1961 and 1990. Several important findings resulted from this review.

- Military jobs that were transferred out of the local communities numbered almost 136,800. These transfers represented permanent long-term reductions in the economic base of the communities.
- Conversion to civilian use led to a total of 158,100 direct jobs, more than replacing the 93,400 DOD civilian and contractor jobs lost due to the closing.
- Fifty-seven former bases became the seat of a number of four-year colleges, community colleges, and post-secondary vocational-technical programs. These schools presently accommodate 73,200 college students, 25,000 secondary vocational-technical students, and 62,200 trainees.
- Seventy-five former bases are host to industrial parks or plants, and 42 established municipal or general aviation airports.

The study concluded that in the short term, closure can have substantial negative effects on the local economy. The difficult transition period generally lasts 3 to 5 years (U.S. Department of Defense, Office of Economic Adjustment, 1990).

Figure 1.3-1 provides employment statistics for 48 Air Force installation closure and reuse actions completed between 1961 and 1990. These Air Force actions resulted in the transfer of approximately 100,000 military personnel. About 28,500 on-base civilian jobs were lost in these actions. More than 70,000 civilian jobs were gained due to reuse of the sites. Considering individual installations, in most cases the number of civilian jobs in 1990 was greater than when the base was under military control. In only about 20 percent of the cases, however, does the number of new civilian jobs exceed the number of both civilian and military jobs lost as a result of base closure.

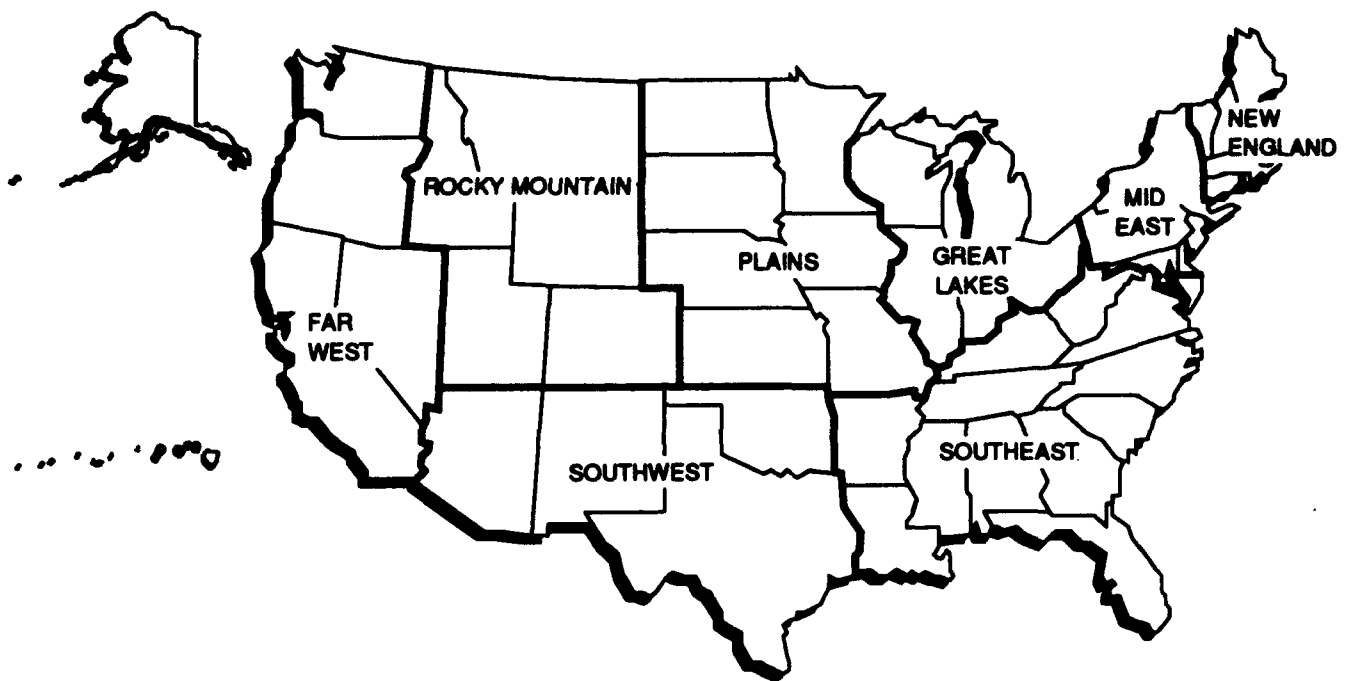
## **1.4 REUSE OPTIONS**

To help identify potential socioeconomic effects associated with the disposal of Wurtsmith AFB, this study addresses a range of reasonable reuse alternatives. For the purpose of conducting the required analysis, the Air Force has adopted the plan developed by the Wurtsmith Area Economic Adjustment Commission (WAEAC) as the Proposed Action. In addition, the Air Force has also analyzed the effects associated with other reasonable reuse alternatives. These include a fire training reuse proposal, a recreation reuse, and a No-Action Alternative that involves no reuse. Actual decisions on reuse of the property will be made by its recipients subsequent to disposal.

The Proposed Action for reuse of Wurtsmith AFB, which combines aircraft maintenance and refurbishing and general aviation activities with commercial and industrial redevelopment, is discussed in Section 1.4.1. The Fire Training Alternative, which focuses on a regional fire training academy, is discussed in Section 1.4.2. The Recreation Alternative, which would conserve extensive open space areas for recreational development, is discussed in Section 1.4.3. The No-Action Alternative, which involves no reuse of the base after closure, is discussed in Section 1.4.4. Under the No-Action Alternative, caretaker services would be provided to ensure base security and to maintain the grounds, existing facilities, and infrastructure. Since the decision to close the base has already been made, caretaker status is considered to represent post-closure conditions. Other Land Use Concepts (i.e., an Advanced Environmental Technology Facility) are discussed in Section 1.4.5.

Under the various reuse alternatives, the acreage proposed to be utilized includes 4,626 acres of base property. Table 1.4-1 lists the proposed reuse activities by type of use and the proposed acreage of each use (reported acreages throughout this document are approximate).





REGION	No. of Bases Closed	Military Jobs Transferred	Civilian Jobs Lost	New Civilian Jobs on Base
1. New England	5	11,241	921	9,947
2. Mid East	3	4,064	11,085	4,298
3. Great Lakes	6	7,595	2,453	10,380
4. Plains	7	18,502	3,129	9,530
5. Southeast	10	22,103	3,349	20,252
6. Southwest	9	24,472	6,058	10,942
7. Rocky Mountain*	3	3,663	336	307
8. Far West	5	8,539	1,093	4,421
Total	48	100,179	28,424	70,077

\* Data for one AFB not available.

Source: U.S. Department of Defense, Office of Economic Adjustment, 1990.

### Summary of Air Force Installation Closure and Reuse Actions Completed between 1961 and 1990

Figure 1.3-1

**Table 1.4-1. Land Use Acreage by Alternative**

<b>Land Use</b>	<b>Proposed Action</b>	<b>Fire Training Alternative</b>	<b>Recreation Alternative</b>
<b>Airfield</b>	<b>1,025</b>	<b>-</b>	<b>-</b>
<b>Aviation support</b>	<b>256</b>	<b>-</b>	<b>-</b>
<b>Industrial</b>	<b>489</b>	<b>234</b>	<b>193</b>
<b>Institutional</b>	<b>12</b>	<b>3,127</b>	<b>60</b>
<b>Commercial</b>	<b>216</b>	<b>130</b>	<b>62</b>
<b>Residential</b>	<b>354</b>	<b>250</b>	<b>92</b>
<b>Public/recreation</b>	<b>2,274</b>	<b>885</b>	<b>4,219</b>
<b>Total</b>	<b>4,626</b>	<b>4,626</b>	<b>4,626</b>

#### **1.4.1 Proposed Action**

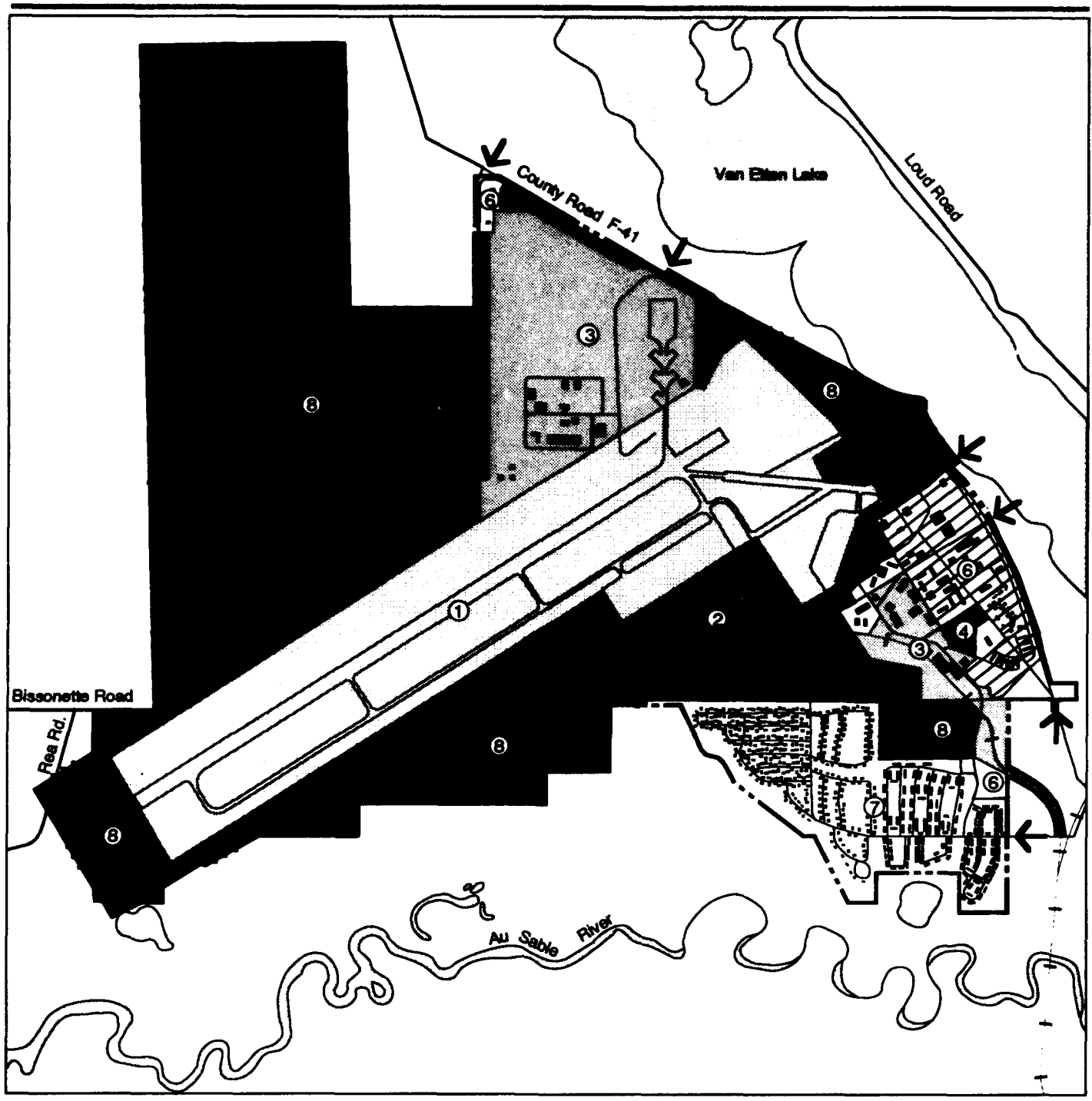
The Proposed Action is a comprehensive reuse plan for Wurtsmith AFB centered around aircraft maintenance and refurbishing and general aviation uses, as well as commercial and light industrial redevelopment. Under the Proposed Action, most of the airfield and aviation support facilities would be retained. Other proposed land use components include residential, institutional, and public facilities/recreation uses (Figure 1.4-1).

**Airfield.** The airfield land use category includes 1,025 acres, or 22 percent of the total base acreage. This alternative assumes that an aircraft refurbishing maintenance facility would locate at Wurtsmith AFB.

**Aviation Support.** The aviation support area encompasses 256 acres, or 5.5 percent of the total base area. Reuse activities would be limited to aircraft maintenance and refurbishing services and small to moderately sized general aviation based aircraft service in existing facilities adjacent to, and southeast of, the apron.

The area west of the aviation support facilities is proposed for future expansion of aviation-related development. This 100-acre area is situated generally parallel to the runway and taxiways and contains the fire station, control tower, a heated vehicle parking facility, and several thousand linear feet of taxiway. The aviation support area to the east incorporates the jet engine test cell, converted hangars, two fire stations, and maintenance shops. This area could support transitional development between aviation-related and commercial development abutting on the southeast.

**Industrial.** The industrial land use, characterized by a mix of light manufacturing and warehousing, encompasses 489 acres, or approximately 11 percent of the total base area. The southern industrial area consists of 87 acres on both sides of the base rail spur in the cantonment in the eastern



#### EXPLANATION

① Airfield	⑤ Institutional * (Education)	⑧ Public Facilities/ Recreation
② Aviation Support	⑥ Commercial	⑧ Recreational Vehicle Park
③ Industrial	⑥ Convention/ Tourist	⑨ Agriculture *
④ Institutional (Medical)	⑦ Residential	⑩ Vacant Land *



\* Not Applicable

#### Proposed Action

--- Base Boundary  
 ← Access Points

Figure 1.4-1

portion of the base. The northern industrial area encompasses 402 acres including the Weapons Storage Area (WSA) and alert area.

Major facilities within the southern industrial area are the base supply warehouse; the base vehicle operations motor pool, administration, and maintenance facility; Base Civil Engineering warehouse; the traffic management facility; the bulk fuel storage facility and fuel operations; and the central heating plant. Most of the motor pool facilities and the supply warehouse, constituting a majority of the available floor space, would be reused for light industry.

The northern industrial area contains the alert aircraft parking aprons, taxiways, WSA and alert facilities, and surrounding security zones. The proposed reuse of the WSA would involve retention of about 175,000 square feet of aviation-related and industrial maintenance and storage facilities.

**Institutional.** The institutional land use category includes the base hospital, which would be reused as a medical facility to provide limited outpatient care (pharmacy, emergency, medical/dental clinic, etc.). The land and facilities proposed for medical-related uses contain about 113,000 square feet on 12 acres.

**Commercial.** Approximately 5 percent (216 acres) of the total base acreage is proposed for various commercial uses, including office, retail, and convention/tourist services. The office component covers 17 acres containing about 100,000 square feet of office space to supply a variety of financial, service, administrative, and other reuse office needs.

The retail component encompasses 42 acres, containing about 30,000 square feet of retained facilities in three areas. The 12-acre commercial retail area at the intersection of County Road F-41 and Rea Road includes the Security Police kennels and the Defense Reutilization and Marketing Office storage facilities. The 8-acre parcel northeast of the existing family housing area contains the housing management office, a day care center, and a base exchange convenience store. The remaining acreage is in the Main Gate area.

The Proposed Action includes a 157-acre area designated for convention/tourist uses. This area encompasses most of the eastern cantonment and includes a variety of facilities proposed to support a program of year-round events and major attractions.

**Residential.** The residential land use contains 354 acres, or 8 percent of the total base area. Approximately 10 percent of the residential units would be demolished, as necessary, to reduce the existing density of 3.5 dwelling units per acre to 1.75 dwelling units per acre in the westernmost portion of

the residential area. About 1,100 single-family and multi-family dwelling units would be retained for use as single-family residences, retirement homes, second/vacation homes, tourist lodging, and public/institutional housing.

**Public Facilities/Recreation.** In the Proposed Action, 49 percent (2,274 acres) of the total base area would be retained for public facilities, open space, and recreation uses. This acreage includes 132 acres of athletic and recreation facilities, 92 acres of recreational vehicle parks, and 2,050 acres of open space, dominating the western half of the base. In addition to the existing uses on these lands, potential uses include natural open space, reforestation and land use buffering, undeveloped or passive recreation, recreation facilities, or local parks. Outdoor facilities, are concentrated in an area north of the military family housing, west of the bulk fuels area. The small arms range just north of the runway would likely be reused as a public firing range.

The large public facilities/recreation area in the northwestern part of the base encompasses forest and wetland areas outside the base security fence and is contiguous with the Au Sable State Forest. Much of this area has remained relatively undisturbed by base activities, and offers valuable habitat for many wildlife species. Under the Proposed Action, this area would be left undeveloped as a conservation area to maintain its ecological value.

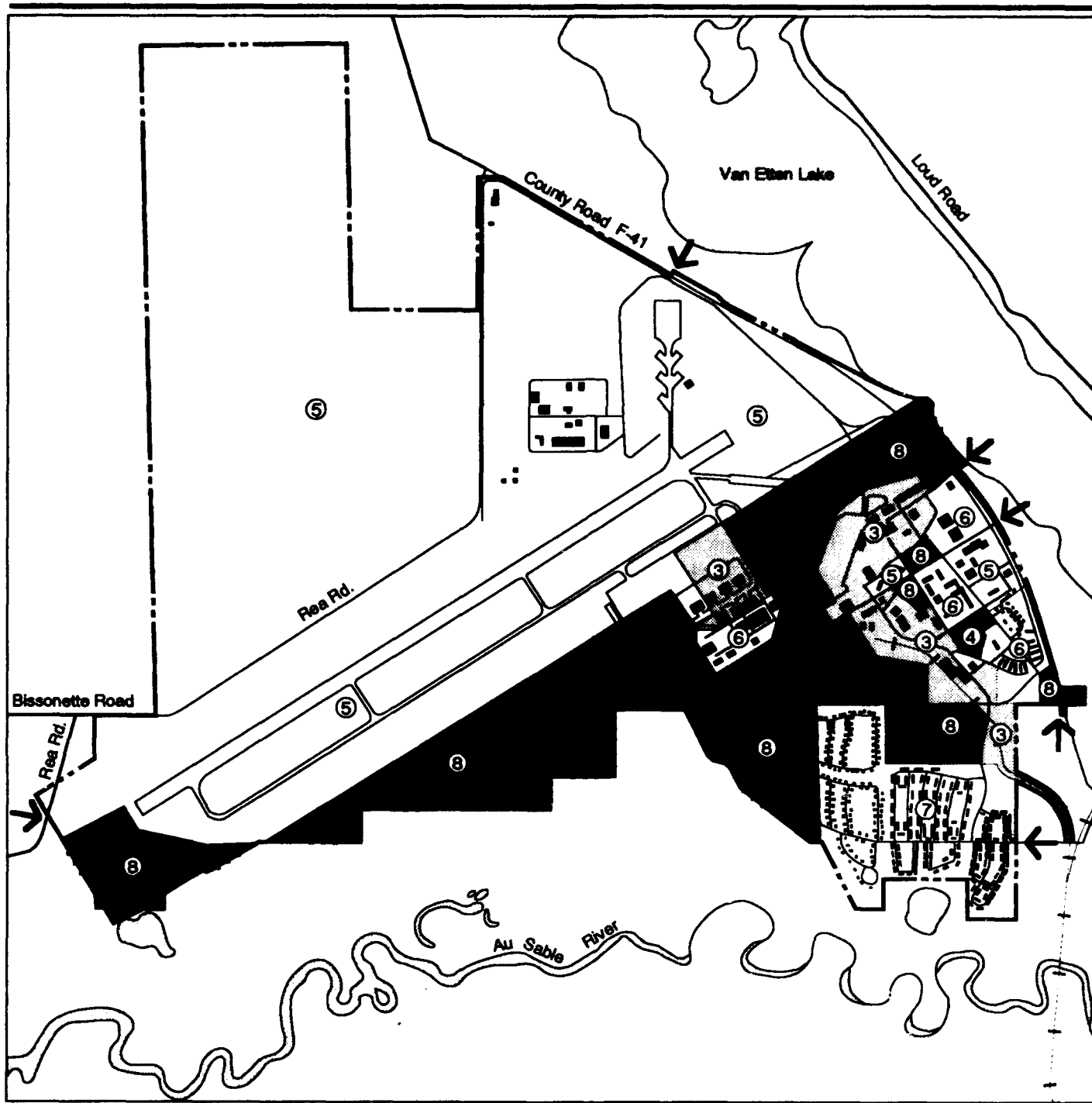
#### **1.4.2 Fire Training Alternative**

Under the Fire Training Alternative (Figure 1.4-2), the runway and all base property to the northwest would be used for a regional fire training facility. Commercial and industrial development are proposed for the cantonment and aviation support areas, and most of the residential areas would be retained.

Major land use components for the Fire Training Alternative include institutional (education), light industrial and warehousing, commercial office and retail, residential, and public facilities/recreation. The total acreage of each land use category is shown in Table 1.4-1.

**Industrial.** Industrial reuse in the Fire Training Alternative is proposed in two areas encompassing a total of 234 acres, or 5 percent of the base area. An area similar to that under the Proposed Action is in the industrial area of the cantonment, and includes acreage along the rail spur to provide rail access to future industrial development, if needed.

This large industrial parcel includes the former squadron operational area, northwest of the cantonment. This area contains several former aircraft maintenance hangars that have been converted to non-aviation warehousing



#### EXPLANATION

① Airfield*	⑤ Institutional (Education)	⑨ Agriculture *
② Aviation Support*	⑥ Commercial	⑩ Vacant Land *
③ Industrial	⑦ Residential	--- Base Boundary
④ Institutional (Medical)	⑧ Public Facilities/ Recreation	← Access Points



\* Not Applicable

#### Fire Training Alternative

Figure 1.4-2

uses, communications and technical laboratories, two fire stations, administrative offices, the jet engine test cell, and maintenance shops. The former aircraft parking apron and an area northeast of the gymnasium would be available for new industrial development.

The second area proposed for planned industrial redevelopment would occupy 50 acres in the Air Combat Command (ACC) operations apron area. The proposed reuse of this area would involve approximately 150,000 square feet of industrial floor space through conversion of hangars.

**Institutional.** The Fire Training Alternative proposes 3,127 acres, or nearly 68 percent of the total base area, for educational and medical uses.

The largest institutional area encompasses the northwestern half of the base and would support a regional fire training facility operated by the Great Lakes Fire Training Academy. Fire training activity areas would occupy 3,075 acres, including the alert apron, WSA facilities, the entire runway, parallel taxiway, and the open space between them.

The facilities within the WSA could be reused to provide storage, administrative space, and maintenance support for training operations. A six-unit residential facility would be used as housing for an estimated 30 students.

New construction would include conversion of some apron areas and taxiways into realistic aircraft and structural burn mock-ups and a 10-million-gallon, double-lined water retention pond. Burn areas would be designed to capture and channel water used during fire fighting through an oil/water separator to the pond.

Some forest fire training, in conjunction with the U.S. Forest Service and the Michigan Department of Natural Resources, is proposed in previously disturbed areas (grenade launching and explosive ordnance disposal ranges). Forest fire activities would be conducted approximately once per year. Most of the forested area in the northwestern part of the base, however, would be left undisturbed as a buffer area around the fire training operational areas.

The community education area occupies 7 acres in the cantonment and contains approximately 40,000 square feet of floor space, including the education center facilities. About one-third of the structures would be demolished to be replaced by up to 25,000 square feet of new educational facilities with ancillary parking and landscaping. Possible uses of these facilities include various vocational, technical, or university-extension classes.

The 33-acre parcel in the cantonment would support private institutional uses, such as church or community group seminars, camps, and retreats. Little demolition and no new construction are proposed for about 150,000 square feet of other existing facilities.

The base hospital would be reused for limited outpatient care (pharmacy, emergency, medical/dental clinic, etc.). The area contains about 117,000 square feet on 12 acres.

**Commercial.** In the Fire Training Alternative, approximately 3 percent (130 acres) of the total base area is proposed for various commercial uses. This includes 31 acres of commercial retail in the commissary/base exchange area. This component could be reused as a regional convention/trade show/events center, with small retail services in the vicinity.

The maintenance shops and commercial office space on 21 acres in the ACC squadron operational area would be reused. Other facilities in this area include classrooms, administrative offices, and an 80,000-square-foot aircraft maintenance shop.

A commercial office park is proposed on a 54-acre area that provides prime frontage along both County Road F-41 and a proposed new east-west arterial. This complex would consist of planned office development that would provide an anchor for related development. Over 150,000 square feet of residential housing and administrative office space would be demolished and replaced with over 200,000 square feet of new office floor space.

The Fire Training Alternative includes development of a hotel on 23 acres designated as commercial area, intended for seasonal tourist overflow or to support convention center or trade show activities. Nearly 275,000 square feet of dormitories and the dining hall would be retained; 45,000 square feet of dormitory space would be demolished and additional parking areas provided.

**Residential.** The residential land use includes 250 acres, or about 5 percent of the total base area. Demolition is proposed for approximately one-third of the residential units to be replaced by public facilities/recreation uses. The remaining 855 family housing units in the southeastern part of the base would be retained for use as permanent, seasonal, and retirement homes.

**Public Facilities/Recreation.** Approximately 19 percent (885 acres) of the total base area would be retained for public facilities, open space, and recreation uses. This acreage includes 83 acres of indoor and outdoor athletic or recreation facilities, 70 acres of local community parks, and 732 acres of open space along the southwestern base boundary separating the cantonment and residential areas from fire training areas.



### **1.4.3 Recreation Alternative**

The focus of the Recreation Alternative (Figure 1.4-3) is restoration and conservation of natural open space for potential multiuse recreation development. Commercial, light industrial, and institutional reuses are proposed in the main base area on a smaller scale than in the other two alternatives. Over 50 percent of the structures would be demolished and limited construction would occur for recreation and open space uses.

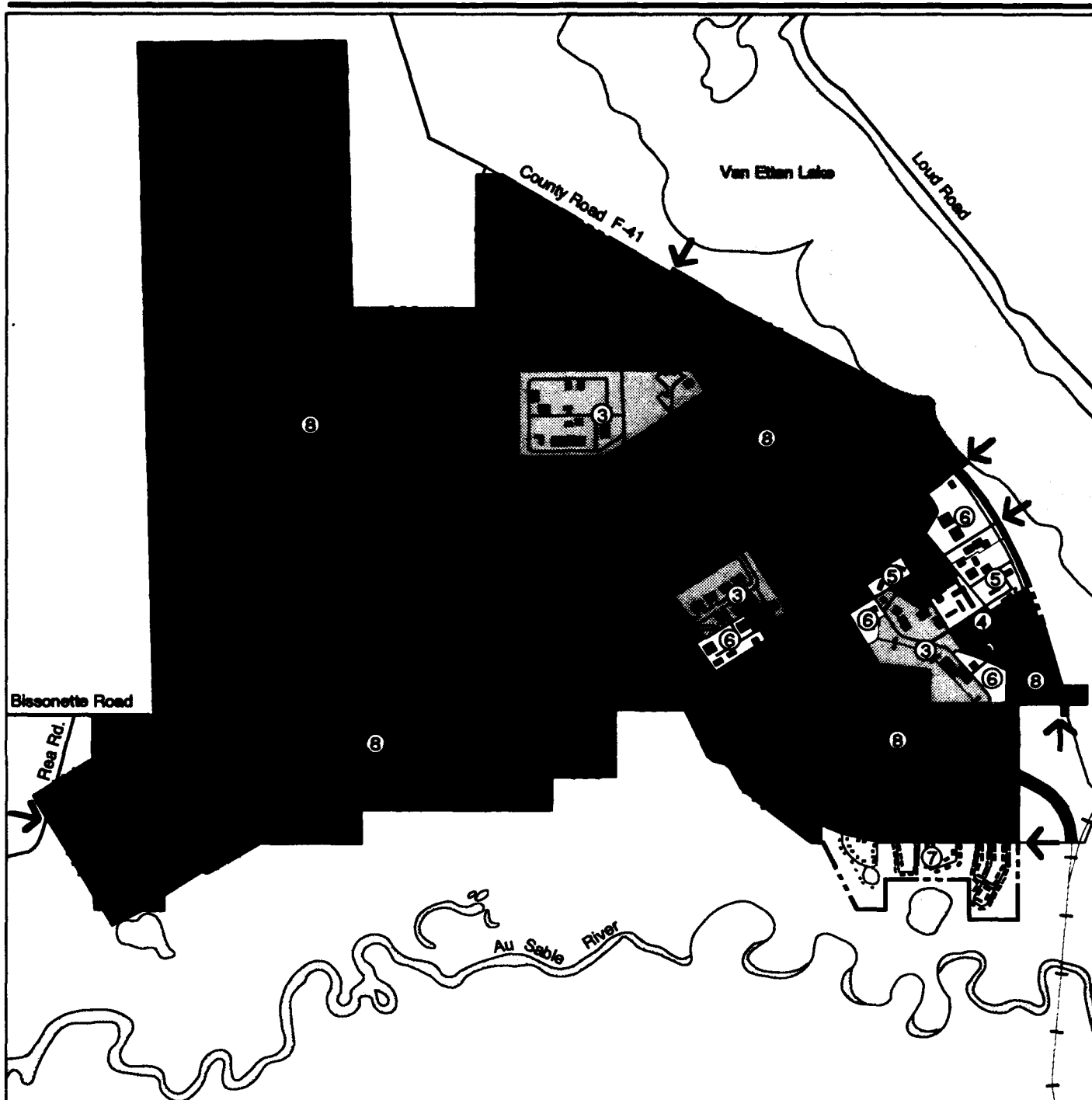
Major land use components for the Recreation Alternative include public facilities/recreation, light industrial, public and private institutional, and commercial. The total acreage of each land use category is shown in Table 1.4-1.

**Industrial.** Industrial reuse in the Recreation Alternative, comprising about 193 acres, or 4 percent of the total base acreage, is planned in three areas. One 46-acre parcel is located and configured similarly to the area in the Proposed Action along the rail spur south of Arrow Street. The second includes the WSA and the southern portion of the alert area. The third includes all of the ACC hangars and the aircraft maintenance shops adjacent to the squadron operations area.

**Institutional.** Institutional land use constitutes slightly over 1 percent (60 acres) of the total base acreage. The community educational area covers 7 acres and contains the education center/youth facility. Private institutional use similar to that under the Fire Training Alternative is proposed for the 40-acre area containing the Base Community Center, the Officer's Club, the dormitories, and dining hall. The 12-acre area containing the medical facility would be the same as discussed under the Fire Training Alternative.

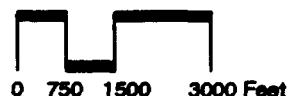
**Commercial.** Slightly more than 1 percent (62 acres) of the total base acreage is proposed for various commercial uses. A 29-acre parcel for commercial retail use in the commissary/base exchange area contains approximately 160,000 square feet of retained facilities. This space would be augmented with an additional 5,000 square feet of new retail development. Approximately 50,000 square feet of office space on 8 acres containing the Civil Engineering facilities would be reused as commercial office space. A 12-acre commercial office park would be located adjacent to the base supply warehouse and the Noncommissioned Officer's Club. The wing/squadron operation offices, classrooms, and flight simulator building, occupying a 13-acre parcel southeast of the operational apron, would be reused as commercial offices.

**Residential.** The residential area in the Recreation Alternative is considerably smaller than that of the other alternatives, occupying about 2 percent (92 acres) of the total base area. Forty duplex and fifteen single-family



# EXPLANATION

① Airfield*	⑤ Institutional (Education)	⑧ Recreational Vehicle Park
② Aviation Support*	⑥ Commercial	⑨ Agriculture *
③ Industrial	⑦ Residential	⑩ Vacant Land *
④ Institutional (Medical)	⑧ Public Facilities/ Recreation	



\* Not Applicable

# Recreation Alternative

--- Base Boundary  
 ← Access Points

Figure 1.4-3

units, all with garages, would be retained for reuse as permanent and seasonal homes.

**Public Facilities/Recreation.** Approximately 92 percent (4,219 acres) of the total base area would be retained for public facilities, open space, and recreation uses. This acreage includes 90 acres of indoor and outdoor athletic or recreation facilities, 90 acres of local community parks, a proposed 120-acre golf course, and over 3,900 acres of open space. Recreation activities in these areas would most likely include camping, hiking, hunting, picnicking, and similar uses. As in the Proposed Action, the large forested area in the northwestern part of the base would remain undeveloped as a conservation area.

#### **1.4.4 No-Action Alternative**

The No-Action Alternative would result in the U.S. Government retaining ownership of the Air Force fee-owned property after closure. Non-fee-owned property would return to the lessee upon mutually agreed termination of the lease. The base property would not be put to further use, but would be preserved, i.e., placed in a condition intended to limit deterioration and ensure public safety. All base property would be placed in caretaker status. The Air Force would be responsible for caretaker activities on Air Force fee-owned land; it is assumed that other property owners would also maintain their property in caretaker status. Caretaker activities, whether by the Air Force or others, would consist of base resource protection, grounds maintenance, existing utilities operations as necessary, and building care. No other military activities/missions are anticipated to be performed on the property.

Under all alternatives an Air Force Base Disposal Agency Operating Location (OL) will be established at Wurtsmith AFB. The responsibilities of the OL will include coordinating post-closure activities with the active force closure activities, establishing a caretaker force to maintain Air Force-controlled properties after closure, and serving as the Air Force local liaison to community reuse groups until lease termination, title surrender, or disposal (as appropriate) of the Air Force-controlled property has been completed. For the purposes of analysis, it was assumed that this team would consist of approximately 50 people at the time of closure, conceptually composed of 10 Air Force employees and 40 non-federal supporting personnel. The OL, as used in this document, may refer to either the Air Force Base Disposal Agency or non-federal personnel.

The future land uses and levels of maintenance would be as follows:

- Maintain structures in "mothballed" condition to limit deterioration.

- Isolate or deactivate some utility distribution lines on base.
- Provide limited maintenance of roads to ensure access.
- Provide limited grounds maintenance to eliminate fire, health, and safety hazards.

#### **1.4.5 Other Land Use Concepts**

In compliance with the Federal Property and Administrative Services Act of 1949, the Air Force solicited proposals from other federal agencies regarding their interest in acquiring any lands or facilities identified for disposal at Wurtsmith AFB. To date, no formal proposals for federal transfers or other independent land use concepts have been identified for Wurtsmith AFB. However, one independent land use concept, the Advanced Environmental Technology Facility, is analyzed in the EIS. This land use concept is not part of any integrated reuse plan, but could be initiated on an individual basis.

**Advanced Environmental Technology Facility.** The Great Lakes and Mid-Atlantic Hazardous Substance Research Center is proposing to establish a national facility at Wurtsmith AFB for field research, development, and demonstration of advanced applied technologies for the decontamination and bioremediation of hazardous wastes, spills, and disposal sites. This facility would involve use of the bioenvironmental engineering laboratory, to conduct sample analysis, and the vehicle maintenance facility, to store vehicles and equipment. The facility staff and students would conduct on-site research at contaminated sites on the base. It is estimated that, over the 20-year analysis period, the facility would accommodate up to 20 direct permanent employees and up to 40 students per year, who would work at the facility temporarily (from 1 week to 3 months each).

## **2.0 COMMUNITY SETTING AND REGION OF INFLUENCE**

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**This chapter describes the community setting in which Wurtsmith AFB is located. In addition, the ROI for the various issues, economic activity, population, housing, public services, public finance, transportation, and utilities, is also identified.**

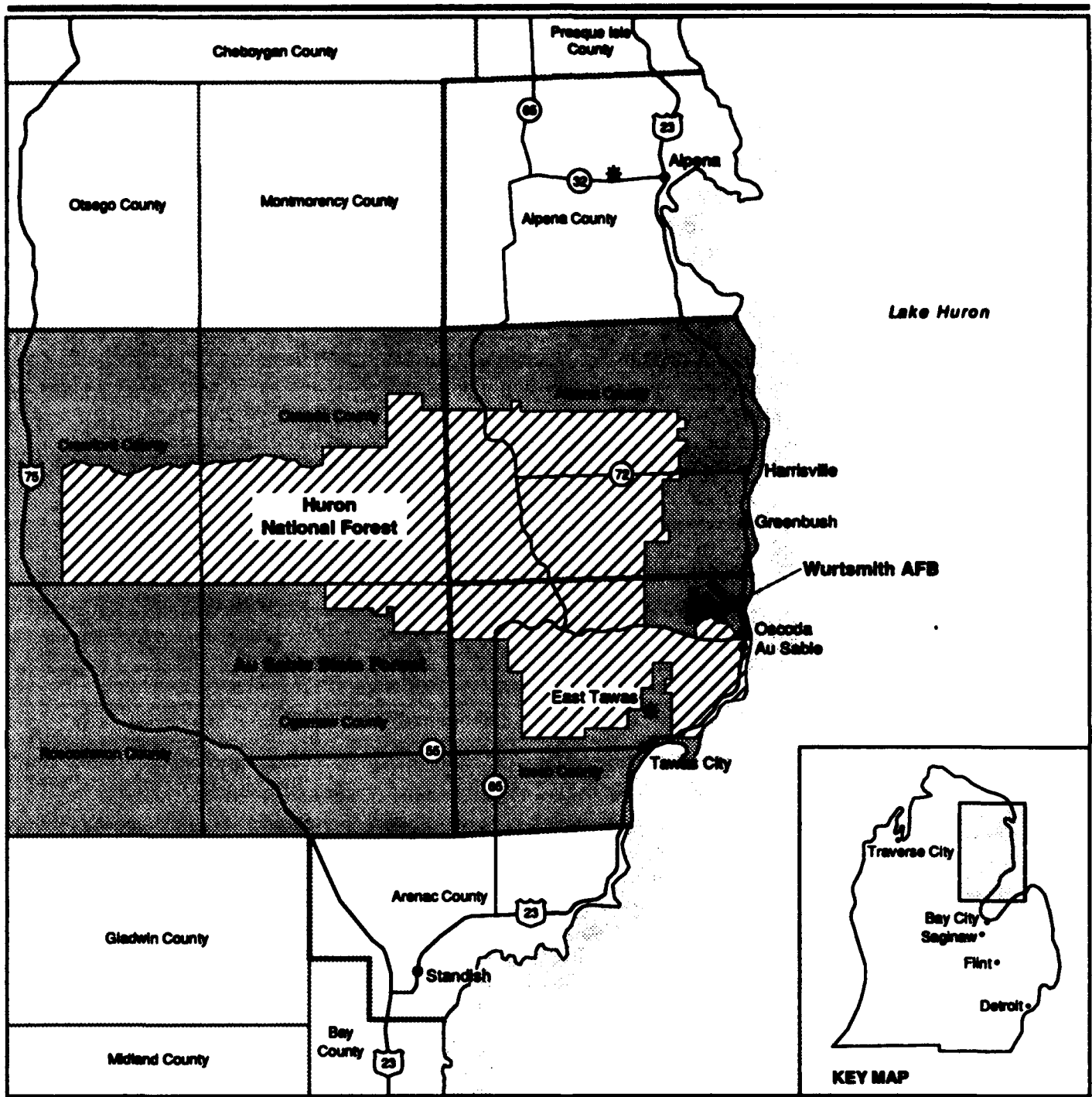
### **2.1 COMMUNITY SETTING**

**Military use of the site now known as Wurtsmith AFB began in 1924, when the Army Air Service started using it as a gunnery range and for winter maneuvers. At that time the area was called Camp Skeel. Beginning in 1942 and for the duration of World War II, the base, renamed Oscoda Army Air Field, was used as a support base for aircrew training. The base was closed in 1945, then reactivated in 1947 under the Continental Air Command, which used it for transient activities. With the creation of the Department of the Air Force in 1947, the base was renamed Oscoda AFB, and hosted units from the Air Defense Command. In 1953, the base was renamed Wurtsmith AFB, after Major General Paul B. Wurtsmith of Michigan, the only flying general to win the Distinguished Service Medal in combat during World War II. Wurtsmith AFB was transferred to the Strategic Air Command effective April 1958 (Ayers Associates, 1990). In 1992, responsibility for the base was transferred to the ACC.**

**Wurtsmith AFB is located within Iosco County in northeastern Michigan, approximately 2 miles from the western shore of Lake Huron (Figure 2.1-1). The area has rail freight service but no rail passenger service. The closest commercial airports are in Alpena and Saginaw.**

**The base encompasses approximately 4,626 acres and is bordered on the southeast by Oscoda Township, on the northeast by Van Etten Lake, on the northwest and west by the Au Sable State Forest, and on the southwest and south by the Huron National Forest (Figure 2.1-1). The Au Sable River, which flows into Lake Huron, is approximately 1/2 mile south of the base. Iosco County and surrounding areas along Lake Huron are popular resort areas, offering fishing, hunting, boating, skiing, snowmobiling, camping, and other recreational opportunities.**

**Wurtsmith AFB is the area's largest employer. Government (federal, state, and local) employs more area residents than any other sector, followed by services, trade, and manufacturing. Automotive product manufacturers are the largest private employers in the area near the base. The rate of increase for jobs and population growth in the area since 1970 has been slower than for the nation as a whole.**



### EXPLANATION

- |  |                    |  |                 |
|--|--------------------|--|-----------------|
|  | Interstate Highway |  | State Forest    |
|  | U. S. Highway      |  | National Forest |
|  | State Highway      |  |                 |
|  | Airport            |  |                 |



Map Source: U.S. Department of Agriculture,  
Forest Service, n.d.

### Regional Map

**Figure 2.1-1**

Tourism plays an integral part in the region's economy as abundant woodlands and waterways provide a natural attraction. State parks and other recreational activities in the region have captured a significant portion of Michigan's total tourism industry. Tourist-related industries such as snack shops, restaurants, camps, trailer parks, boat dealers, hotels, motels, and tourist courts provide the region with a primary source to generate revenue and employment opportunities.

More than 80 percent of personnel assigned to Wurtsmith AFB live in Oscoda Township. Small numbers of personnel live in Au Sable Township, Tawas City, East Tawas, and other townships in Iosco County. In addition, small numbers live north of the base in Alcona County, particularly in the communities of Greenbush and Harrisville. Approximately 2,000 military retirees live in the area.

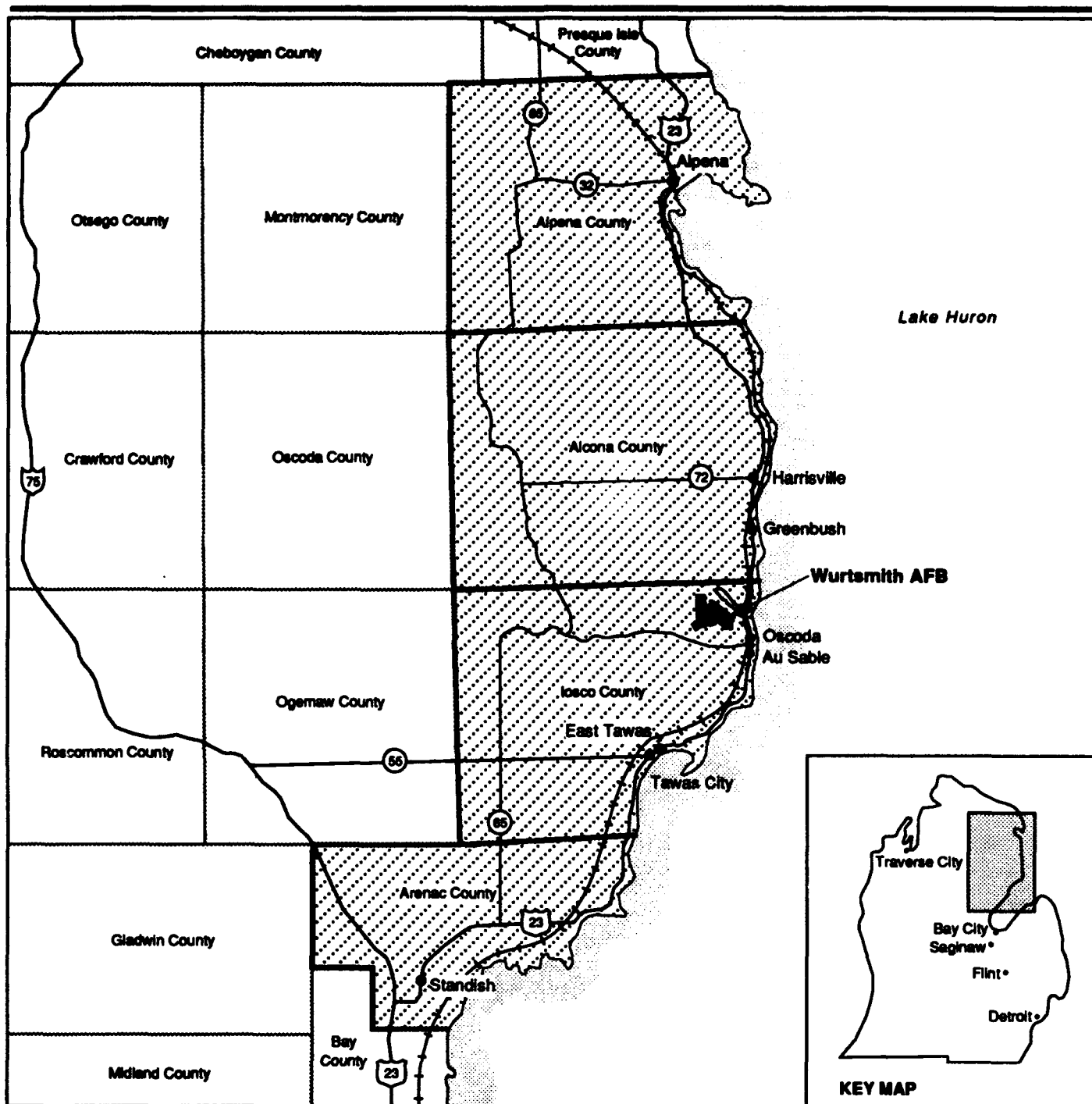
Several units of local general government provide services to the population associated with Wurtsmith AFB. These jurisdictions include Iosco and Alcona counties and the townships of Oscoda, Au Sable, and Greenbush. Oscoda Area Schools and Tawas Area Schools serve more than 97 percent of the students who are dependents of military and civilian personnel employed at Wurtsmith AFB.

Utilities for the base and adjacent communities are provided by the Oscoda Township and Tawas water supply systems, the Oscoda and Tawas wastewater treatment plants (WWTPs), the Pinconning Landfill via the Tawas transfer station, Consumers Power Company (CPCO), and Michigan Consolidated Gas Company (MichCon).

## **2.2 REGION OF INFLUENCE**

The ROI is defined as the region in which the principal direct and secondary socioeconomic effects of closure and reuse actions at Wurtsmith AFB are likely to occur and are expected to be of most consequence for local jurisdictions (Figure 2.2-1). It is important to note that the ROI may vary from one issue to another.

Two factors were important in determining the ROIs used in this analysis. The first was the distribution of residences for 1992 military and civilian personnel stationed at Wurtsmith AFB. This residential distribution is not only an aid in determining where the greatest effects of closure would occur, but also provides a guide to where the possible effects of reusing the base would occur as well, since it reflects the revealed preferences of those employed at the site. Data for this residential distribution were obtained by school district and zip code for all personnel employed at the base for whom data were available.



# EXPLANATION

- |                    |              |
|--------------------|--------------|
| Interstate Highway | Railroad     |
| U. S. Highway      | ROI Boundary |
| State Highway      |              |



## Region of Influence

Figure 2.2-1



The second factor in determining the extent of socioeconomic effects is the degree of linkage among the economies of the various communities in the region. This linkage, based on trade among sectors within the region, determines the nature and magnitude of multiplier effects of actions at the base. While both the residential locations of Wurtsmith AFB personnel and the nature of economic interactions in the region helped to define the ROIs for this analysis, other specific socioeconomic factors such as service area boundaries have also been used in further influencing the selection of ROIs discussed in this document.

#### **Economic Resource Impact Statements**

Regional purchases associated with Wurtsmith AFB, including both base spending for goods and services and base personnel spending of payrolls, are reported in Wurtsmith AFB's Economic Resource Impact Statements (ERISs). The ERISs for the past 5 federal fiscal years (FYs), 1987 through 1991, were examined. The regional expenditures cited in these statements are reported for an area within a 50-mile radius around the base, which includes the counties of Alcona, Alpena, Arenac, Bay, Iosco, Midland, Ogemaw, Oscoda, and Saginaw. While this 50-mile radius captures the socioeconomic effects of the base and serves as a departure point in defining the ROI, it is oftentimes too wide an area for pinpointing where the socioeconomic effects will occur within the region. Consequently, this 50-mile radius was not used to define the ROI.

#### **Economic Activity**

It is anticipated that almost all of the regional reuse demands associated with construction and operation payroll expenditures, and most of the demands associated with construction and operation goods and services expenditures will occur within Alcona, Alpena, Arenac, and Iosco counties. Most demands associated with regional economic effects of base closure also are anticipated to be concentrated within this four-county ROI. Potential indirect effects which may occur outside the ROI are expected to be minimal after dispersion and are excluded from further analysis.

Wurtsmith AFB is the largest employer in the ROI. Baylock Manufacturing, Baylock Products, and Starboard Industries are the ROI's major private employers. Private industries include automobile products manufacturing and service and trade establishments supporting the ROI's substantial tourism and recreation sector.

Total jobs in 1990 numbered 38,272 in the ROI; Wurtsmith AFB employed 3,969 military and civilian personnel on base in 1990. The ROI's share of military employment was 8.8 percent in 1990, well above the national average of 1.9 percent.

All government jobs (federal military, federal civilian, state, and local) accounted for 25.9 percent of total 1990 ROI jobs. The service sector accounted for 21.0 percent, retail trade represented 18.5 percent, manufacturing jobs totaled 13.2 percent, and all other sectors accounted for the remaining 21.4 percent of ROI jobs.

Jobs in the ROI grew at an average annual rate of 1.8 percent from 1970 through 1990 and at 2.1 percent from 1980 through 1990. This compares to statewide growth rates of 1.5 and 1.7 percent and national rates of 2.1 and 2.0 percent over the same periods. Almost all of the growth occurred prior to 1985. Total ROI employment in 1990 was nearly unchanged from its 1985 level.

### **Population**

Population effects from the closure and potential reuse of Wurtsmith AFB were analyzed for the four-county ROI of Iosco, Alcona, Alpena, and Arenac counties including the selected townships of Oscoda, Au Sable, and Greenbush. The ROI accounted for 92.9 percent of the places of residence of civilian and military personnel employed at Wurtsmith AFB. Military and civilian personnel working at the base represent at least 6.7 percent of 1990 population for these communities. Population effects for the communities within the remainder of the ROI were expected to be too small to warrant further analysis.

The population in the ROI totaled 85,890 in 1990, increasing at an average annual rate of just 0.1 percent between 1980 and 1990 and 1.4 percent from 1970 to 1980.

From 1980 to 1990, Iosco, Alcona, and Arenac counties increased in population at average annual rates of 0.6 percent, 0.4 percent, and 0.2 percent, respectively. The populations of Oscoda, Au Sable, and Greenbush increased from 1980 to 1990. Alpena County's population declined during this period, at an average annual rate of 0.5 percent.

The population centers of these townships are the unincorporated communities of Oscoda, Au Sable, and Greenbush. These communities are located in the eastern portions of the three townships along U.S. 23 and the shore of Lake Huron. The communities of Oscoda and Au Sable, both located at the mouth of the Au Sable River, together form the largest built-up area in the three townships.

While the township populations increased, the population of the unincorporated communities of Oscoda and Au Sable (2,603 in 1990) decreased at an average of 4.6 percent annually between 1980 and 1990. The 1990 population (2,603) in these two communities represented 27 percent of the off-base population in Oscoda and Au Sable townships.

During July and August, tourism in this area can double or even triple the population in these communities.

### **Housing**

Housing effects from the closure and reuse of Wurtsmith AFB were analyzed for the ROI, defined as Iosco, Alcona, Alpena, and Arenac counties and the selected townships of Oscoda, Au Sable, and Greenbush. Because housing effects are expected to follow the distribution of population effects as discussed above, the ROI is the same for housing issues as it is for population issues.

Total ROI housing units numbered 51,924 in 1990, having increased an average of 420 units (0.8 percent) annually since 1980. All four counties experienced increases in their housing stock with largest gains in Iosco County. Oscoda and Au Sable townships experienced increases in housing stock between 1980 and 1990, while Greenbush Township housing stock was essentially unchanged during this decade.

Many of these ROI housing units are used as seasonal or vacation homes by persons residing outside the ROI. Excluding these seasonal homes and the number of housing units on Wurtsmith AFB, the total nonseasonal off-base housing units were estimated at 33,294 in 1990.

### **Public Services**

The ROI for the public service analysis (i.e., police and fire protection, general government, public education, and health care) is the principal jurisdictions that have the closest linkage to the Wurtsmith AFB site: those providing services directly to Wurtsmith AFB military and civilian personnel or their dependents; those having public service and facility arrangements with the base; and those likely to be most affected by potential reuse of the base.

Potentially affected jurisdictions include the governments of Iosco County; Alcona County; and Oscoda, Au Sable, and Greenbush townships. School districts that would be affected by closure and reuse of the base include Oscoda Area Schools and Tawas Area Schools.

Iosco and Alcona counties provide building inspection, road work, public safety services, judicial services, health care, and social services. Oscoda, Au Sable, and Greenbush provide, either directly or through contract with other local governments, planning and building services, recreation and community services, public works, police and fire protection, library, and development services. Au Sable Township contracts some services to Oscoda Township and Iosco County. Greenbush Township contracts some services to Alcona County.

The Wurtsmith AFB Fire Department has mutual aid agreements with seven other area fire departments, including the Oscoda Township Fire Department.

Oscoda Area Schools and Tawas Area Schools provide public elementary and secondary education to most of the students associated with Wurtsmith AFB, as there are no DOD schools on base. Oscoda Area Schools is the principal provider of education to student dependents of Wurtsmith AFB personnel. Enrollment in Oscoda Area Schools has declined since 1970, with Fall 1991 enrollment at 73 percent of the Fall 1970 level. In Fall 1991, a total of 2,274 students, or 67.2 percent of Oscoda Area Schools enrollment, were related to Wurtsmith AFB. Of that total 1,459 were military dependents, 272 were dependents of civilians working on base, and 543 were dependents of secondary workers generated by base-related expenditures. A total of 133 students or 7.5 percent of Tawas Area Schools enrollment were related to the base in 1991, 32 of which were military dependents.

Alpena Community College in Alpena is the closest institution of higher education to Wurtsmith AFB.

#### **Public Finance**

The ROI for public finance consists of the local governmental units that are expected to experience the majority of effects from base closure and/or potential reuse. These jurisdictions include the counties of Iosco and Alcona; the townships of Oscoda, Au Sable, and Greenbush; and the school districts of Oscoda Area Schools and Tawas Area Schools.

These local government units provide services to Wurtsmith AFB area residents using funds raised principally through taxes, charges to community residents and local organizations for services, state transfers, and federal transfers.

Oscoda Area Schools provide elementary and secondary education for most of the dependents of military personnel assigned to Wurtsmith AFB. The district received 51 percent of its FY 1992 funding from local sources, 28 percent from state sources, and the remaining 21 percent from federal sources. Federal financing included \$2,215,000 from the Federal Impact Assistance Program (P.L. 81-874) for community schools serving military bases. State funding is tied to enrollment and attendance levels.

#### **Transportation**

The ROI for the transportation analysis includes the communities of Oscoda and Au Sable with emphasis on the area surrounding Wurtsmith AFB. Within this geographic area, the analysis examines the principal existing

road and rail transportation networks, including the segments in the region that serve as direct or indirect linkage to the base, and those that would be affected during reuse, including those commonly used by military and civilian personnel at Wurtsmith AFB.

The base is located just off County Road F-41, approximately 3 miles from U.S. 23, the major north-south highway, which provides the principal access route to the base from the north and south. Two gates provide access onto the base: the Main Gate, located at Skeel Avenue, which is used by civilian and military personnel and visitors, and for industrial and commercial deliveries; and the Capehart Gate, which provides direct access to the base housing area.

The Detroit and Mackinac Railroad provides freight service to the base and local area using a single track. There is no passenger rail service to the area.

Iosco County Airport is approximately 10 miles south of the base, and supports private aviation uses only. The closest commercial airports are in Alpena, approximately 45 miles north of the base, and the Tri-City Airport in Saginaw, about 90 miles to the south.

#### **Utilities**

The ROI for the utilities analysis (including water supply and distribution, wastewater collection and treatment, solid waste collection and disposal, and energy supply and distribution) generally consists of the service areas of the local purveyors that serve Wurtsmith AFB and the surrounding affected communities, which include Oscoda and Au Sable townships and other portions of Iosco County. Other affected communities have widely dispersed populations and represent a small portion of the utility providers' customers; therefore, they were not included in the ROI for the utilities analysis. Utility providers include the Oscoda Township and Tawas water supply systems, the Oscoda and Tawas WWTPs, the Pinconning Landfill via the Tawas transfer station, CPCO, and MichCon.

Utilities are provided to Wurtsmith AFB from both on-base and off-base sources. The base derives its water from on-base wells. Base wastewater is treated in the on-base sanitary sewage treatment system consisting of aerated ponds and seepage beds. Solid waste generated on base is hauled to the Tawas transfer station and then to the Pinconning Landfill, licensed by the Michigan Department of Natural Resources, and owned and operated by a private contractor. Base electricity is purchased from CPCO. Natural gas, which fuels the base's central heating system, is supplied to the base by MichCon.

Communities near the base provide some of their own utilities and contract with regional suppliers for others. Oscoda and Au Sable derive their water from nine wells; Oscoda and Au Sable are served by a sewer network connected to Oscoda WWTP. Solid waste disposal for Oscoda and Au Sable is at the Pinconning Landfill. CPCO provides electricity to the communities near the base. MichCon supplies natural gas to area communities.

## **3.0 SOCIOECONOMIC CONDITIONS**

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### **3.1 INTRODUCTION**

This chapter presents recent socioeconomic trends in the region (preclosure conditions), and outlines the effects of base closure (closure conditions) for comparison with projected effects of each potential reuse. Of particular importance in this analysis are the site-related and migratory effects. Site-related effects are defined as the activities associated with the base area. These would include both direct and secondary employment and the resultant effects on population. Migratory effects are defined to be the persons who would leave the ROI because of closure-related reductions in employment, and the corresponding effects on population, housing, public services, public finance, transportation, and utilities.

The migratory effects are a component of the site-related effects. For example, the site-related employment effects would show the total job losses due to closure of the base. Some of these newly unemployed people would leave the region to seek employment elsewhere thus resulting in migratory effects. The difference between the site-related effects and migratory effects is the portion of people who would lose their jobs due to closure and would remain in the ROI, adding to the available labor pool. Persons unrelated to the site-related activities who would leave the ROI due to closure are not included in the analysis.

A summary of conditions at closure of Wurtsmith AFB is provided in Table 3.1-1. The methods, data, and technical approach used in analyzing regional socioeconomic conditions due to base closure are discussed in Appendix B.

### **3.2 ECONOMIC ACTIVITY**

This section presents recent trends in regional employment, earnings, and income, and describes the effects of base closure. As defined in Chapter 2, most of the regional economic effects of base closure will be concentrated in the ROI comprising Alcona, Alpena, Arenac, and Iosco counties.

#### **Recent Trends**

**Jobs.** The number of jobs within the ROI totaled 38,272 in 1990. This key measure of regional economic activity increased between 1970 and 1990 by an average of 1.8 percent per year (Table 3.2-1). This regional job growth rate was slightly higher than average annual job growth in Michigan during the same period (1.5 percent), but lower than the growth in jobs at the national level (2.1 percent per year). All ROI job growth during this

**Table 3.1-1. Effects of Closure of Wurtsmith AFB**

<b>Resource Category</b>	<b>1990 through Closure</b>
<b>Economic Activity</b>	
<b>Employment</b>	Decline of 5,329 direct and secondary site-related jobs in the ROI
<b>Earnings (1989\$)</b>	Decline of 113.0 million/year in the ROI
<b>Population</b>	
<b>Military-related</b>	Decline of 4,767 on-base and 2,507 off-base residents in the ROI
<b>Civilian-related</b>	Decline of almost 2,048 additional off-base residents in the ROI (including military retirees)
<b>Housing</b>	Decline in demand of approximately 1,565 off-base units in the ROI.
<b>Public Services</b>	
General Government, Police and Fire	
Iosco County	Decline in off-base population served of 3,213
Oscoda Township	Decline in off-base population served of 2,035
Au Sable Township	Decline in population served of 733
Alcona County	Decline in population served of 778
Greenbush Township	Decline in population served of 304
Education	Decline in ROI enrollments of 1,774 students
Health care	Wurtsmith AFB hospital closed
<b>Public Finance (1989\$)</b>	
Iosco County	Shortfalls of 529,469 per year
Oscoda Township	Shortfalls of 238,702 per year
Au Sable Township	Shortfalls of 30,207 per year
Alcona County	Shortfalls of 44,787 per year
Greenbush Township	Shortfalls of 9,055 per year
Oscoda Area Schools	Shortfalls of 2,187,796 per year
Tawas Area Schools	Shortfalls of 33,067 per year
<b>Other Relevant Resources</b>	
<b>Transportation</b>	Base-related traffic reductions on all local roads; an average of 30 percent reduction on U.S. 23 and 68 percent reduction on County Road F-41
<b>Utilities</b>	Projected demand for water, wastewater treatment, solid waste disposal, electricity, and natural gas would be 35 to 60 percent lower than 1990 levels

**Note:** Although Wurtsmith AFB is scheduled to close in June 1993, data limitations required that most effects be calculated annually. Because 1994 is the first full calendar year following closure, short-term effects were calculated through that year.



**Table 3.2-1. Summary of Economic Indicators, Four-County ROI, State of Michigan,  
and United States**  
Page 1 of 2

	1970	1980	1989	1990	Average Annual % Change
<b>Iosco County</b>					
Total jobs	10,612	10,951	14,457	14,834	1.7
Civilian	6,797	8,203	11,047	11,588	2.7
Military	3,815	2,748	3,410	3,246	-0.8
Military, % of total	35.9	25.1	23.6	21.9	NA
Civilian labor force	9,050	13,025	15,650	15,550	2.7
Unemployment rate	6.9	15.0	9.6	9.5	NA
Earnings per job (1989\$)	20,217	18,353	17,290	16,799	-0.9
Per-capita income (1989\$)	10,421	10,988	12,538	12,510	0.9
<b>Alcona County</b>					
Total jobs	1,862	2,332	2,527	2,553	1.6
Civilian	1,827	2,311	2,502	2,529	1.6
Military	35	21	25	24	-1.9
Military % of total	1.9	0.9	1.0	0.9	NA
Civilian Labor Force <sup>(a)</sup>					
Unemployment rate <sup>(a)</sup>					
Earnings per job (1989\$)	15,725	13,172	13,370	12,939	-1.0
Per-capita income (1989\$)	9,095	10,822	12,343	12,392	1.6
<b>Alpena County</b>					
Total jobs	11,064	13,549	14,646	15,063	1.6
Civilian	10,870	13,471	14,571	14,991	1.6
Military	194	78	75	72	-4.8
Military % of total	1.8	0.6	0.5	0.5	NA
Civilian labor force	11,250	15,750	13,275	13,650	1.0
Unemployment rate	12.0	13.7	10.2	10.3	NA
Earnings per job (1989\$)	23,031	21,685	19,583	19,109	-0.9
Per-capita income (1989\$)	10,239	12,395	13,879	13,959	1.6
<b>Arenac County</b>					
Total jobs	3,200	4,150	5,717	5,822	3.0
Civilian	3,165	4,118	5,680	5,786	3.1
Military	35	32	37	36	0.1
Military % of total	1.1	0.8	0.6	0.6	NA
Civilian labor force	4,450	6,175	6,475	7,750	2.8
Unemployment rate	5.6	14.2	9.9	7.7	NA
Earnings per job (1989\$)	17,664	16,758	14,915	14,651	-0.9
Per capita income (1989\$)	10,191	11,819	13,016	12,965	1.2

Notes: NA = Not applicable. Jobs are full- and part-time civilian and military employment by place of work. Civilian labor force and unemployment rate are by place of residence. Earnings and income are in constant 1989 dollars, reflecting price levels prevailing in 1989. Earnings per job and per-capita income for 1970, 1980, and 1990 were converted to constant 1989 dollars using the Consumer Price Index for all urban consumers/all items. Average annual percent a compound average for the period covering the earliest and most recent years of available data. All values shown represent annual averages. Earnings per job are the sum of wage and salary disbursements, including personal contributions for social insurance, other labor income, and proprietors' income divided by total jobs. Per capita income is personal income received by persons from all sources divided by the mid-year population estimate.

(a) Data reported for Iosco County and Alcona County are combined.

**Table 3.2-1. Summary of Economic Indicators, Four-County ROI, State of Michigan,  
and United States**  
Page 2 of 2

	1970	1980	1989	1990	Average Annual % Change
<b>ROI Total</b>					
Total jobs	26,738	30,982	37,347	38,272	1.8
Civilian	22,659	28,103	33,800	34,894	2.2
Military	4,079	2,879	3,547	3,378	-0.9
Military, % of total	15.3	9.3	9.5	8.8	NA
Civilian labor force	24,750	34,950	35,400	36,950	2.0
Unemployment rate	9.0	14.2	9.9	9.4	NA
Earnings per job (1989\$)	20,763	19,206	17,561	17,124	-1.0
Per-capita income (1989\$)	10,183	11,647	13,076	13,090	1.3
<b>State of Michigan</b>					
Total jobs	3,510,938	3,990,894	4,667,355	4,728,825	1.5
Civilian	3,467,705	3,960,798	4,635,593	4,698,201	1.5
Military	43,233	30,096	31,762	30,624	-1.7
Military, % of total	1.2	0.8	0.7	0.6	NA
Civilian labor force	3,590,000	4,292,000	4,592,000	4,578,000	1.2
Unemployment rate	6.7	12.4	7.1	7.5	NA
Earnings per job (1989\$)	27,209	26,611	25,634	24,959	-0.4
Per-capita income (1989\$)	13,207	15,296	17,650	17,436	1.4
<b>United States</b>					
Total jobs	89,752,500	112,256,700	136,074,700	137,160,200	2.1
Civilian	86,520,500	109,805,700	133,306,700	134,492,200	2.2
Military	3,232,000	2,451,000	2,768,000	2,668,000	-1.0
Military, % of total	3.6	2.2	2.0	1.9	NA
Civilian labor force	82,771,000	106,940,000	123,869,000	124,787,000	2.1
Unemployment rate	4.9	7.1	5.3	5.5	NA
Earnings per job (1989\$)	23,421	22,590	23,348	23,381	0.0
Per-capita income (1989\$)	12,946	14,926	17,592	17,738	1.6

**Notes:** NA = Not applicable. Jobs are full- and part-time civilian and military employment by place of work. Civilian labor force and unemployment rate are by place of residence. Earnings and income are in constant 1989 dollars, reflecting price levels prevailing in 1989. Earnings per job and per-capita income for 1970, 1980, and 1990 were converted to constant 1989 dollars using the Consumer Price Index for all urban consumers/all items. Average annual percent a compound average for the period covering the earliest and most recent years of available data. All values shown represent annual averages. Earnings per job are the sum of wage and salary disbursements, including personal contributions for social insurance, other labor income, and proprietors' income divided by total jobs. Per capita income is personal income received by persons from all sources divided by the mid-year population estimate.

(a) Data reported for Iosco County and Alcona County are combined.

**Sources:** Michigan Employment Security Commission, 1977, 1984, 1991a, 1991b. U.S. Bureau of Economic Analysis, 1991 and 1992b; U.S. Council of Economic Advisors, 1992.

period occurred prior to 1985. ROI employment in 1990 was basically unchanged from its 1985 level.

**Jobs by Major Sector.** The major employment sectors within the four-county ROI are government, services, retail trade, and manufacturing (Figure 3.2-1). Government, including state and local government and federal military and civilian sectors, provided 9,926 jobs in the ROI in 1990, or 25.9 percent of the ROI total. Services provided 8,046 ROI jobs in 1990, or 21.0 percent of the total. Of the total ROI jobs in 1990, there were 7,096 retail trade jobs and 5,042 manufacturing jobs within the four counties, or 18.5 percent and 13.2 percent, respectively.

The ROI unemployment rate was 9.4 percent in 1990 (Table 3.2-1), and increased to 11.1 percent in 1991 (Michigan Employment Security Commission, 1992). ROI unemployment rates for 1980, 1989, and 1990 have exceeded those of Michigan and the nation as a whole.

Alpena and Iosco counties account for most of the jobs in the four-county ROI. In 1990, these two counties provided 78.1 percent of total ROI jobs.

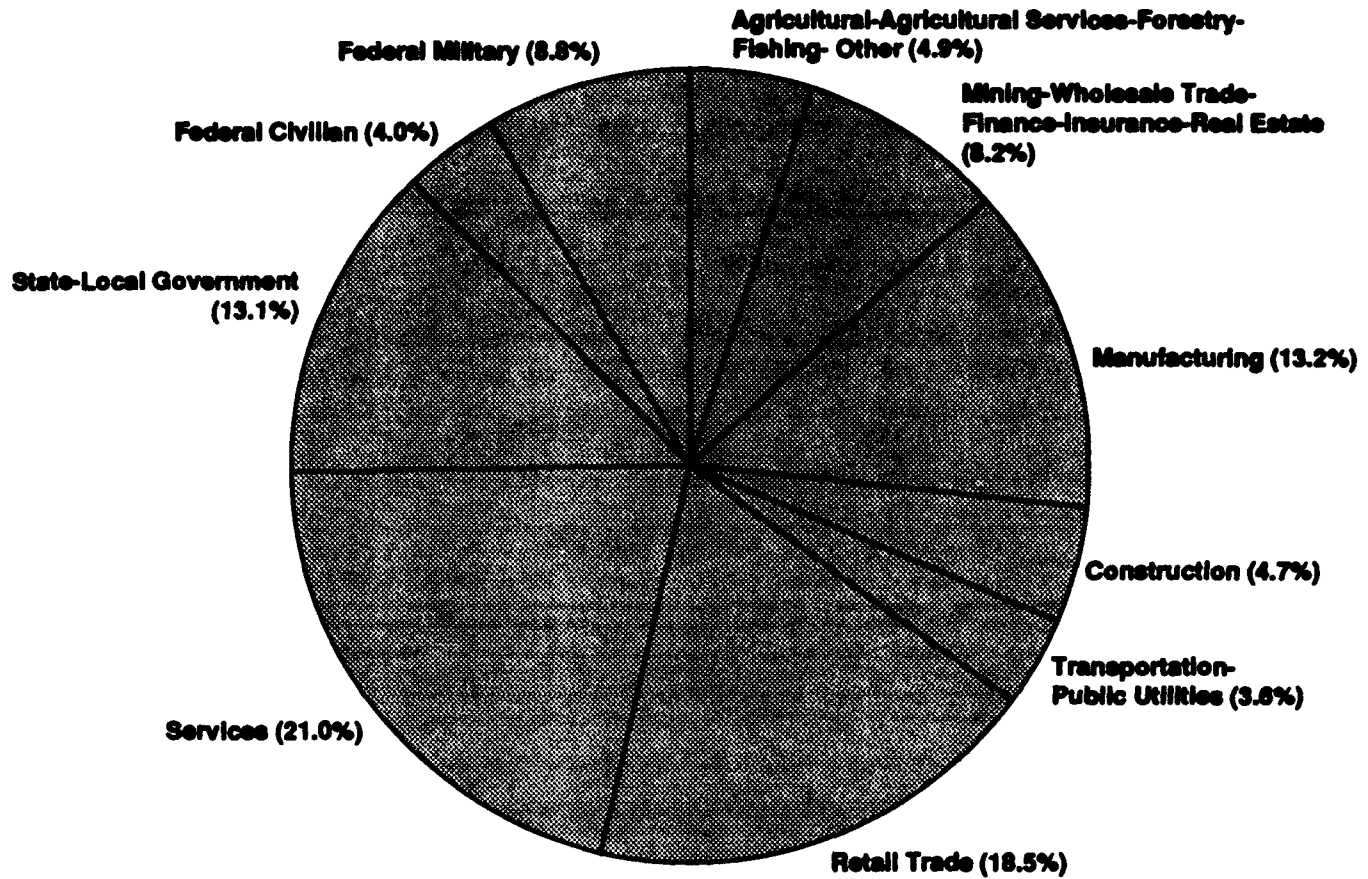
**Earnings and Income.** Average annual earnings per job and per-capita personal income in the ROI were lower than the state and national average levels in 1990 (Table 3.2-1). Earnings per job (in 1989 dollars) in the ROI were \$17,124 in 1990, down from \$20,763 in 1970. Earnings per job for the state of Michigan declined at an average annual rate of 0.4 percent between 1970 and 1990. Earnings per job for the United States remained virtually the same at \$23,421 in 1970 and \$23,381 in 1990. A comparison of average 1990 earnings per job by sector indicates that annual earnings for jobs in the transportation and public utilities sector were higher than the average for other sectors. Average earnings per job in the manufacturing, military, state and local government, and construction sectors of the four-county economy were the next highest. Earnings per job declined in most sectors of the region's economy between 1980 and 1990.

In 1990, per-capita income (1989 dollars) in the ROI, including both labor and non-labor-adjusted income per person, was \$13,090, having grown from \$10,183 in 1970 (1.3 percent per year). This growth in per-capita income in the ROI was slightly less than the comparable annual growth at the state and national levels (1.4 and 1.6 percent) over the same period, resulting in 1990 Michigan and United States per-capita incomes of \$17,436 and \$17,738, respectively.

**Wurtsmith AFB Employment, Payrolls, and Expenditures.** Total employment at Wurtsmith AFB in FY 1991 was 3,930, including 3,052 military jobs and 878 civilian jobs. Total employment decreased by 156 jobs (3.8 percent) between FY 1987 and FY 1991 (Figure 3.2-2 and Table 3.2-2). The number of military personnel assigned to the base decreased by 316

## Major Industrial Sectors, 1990

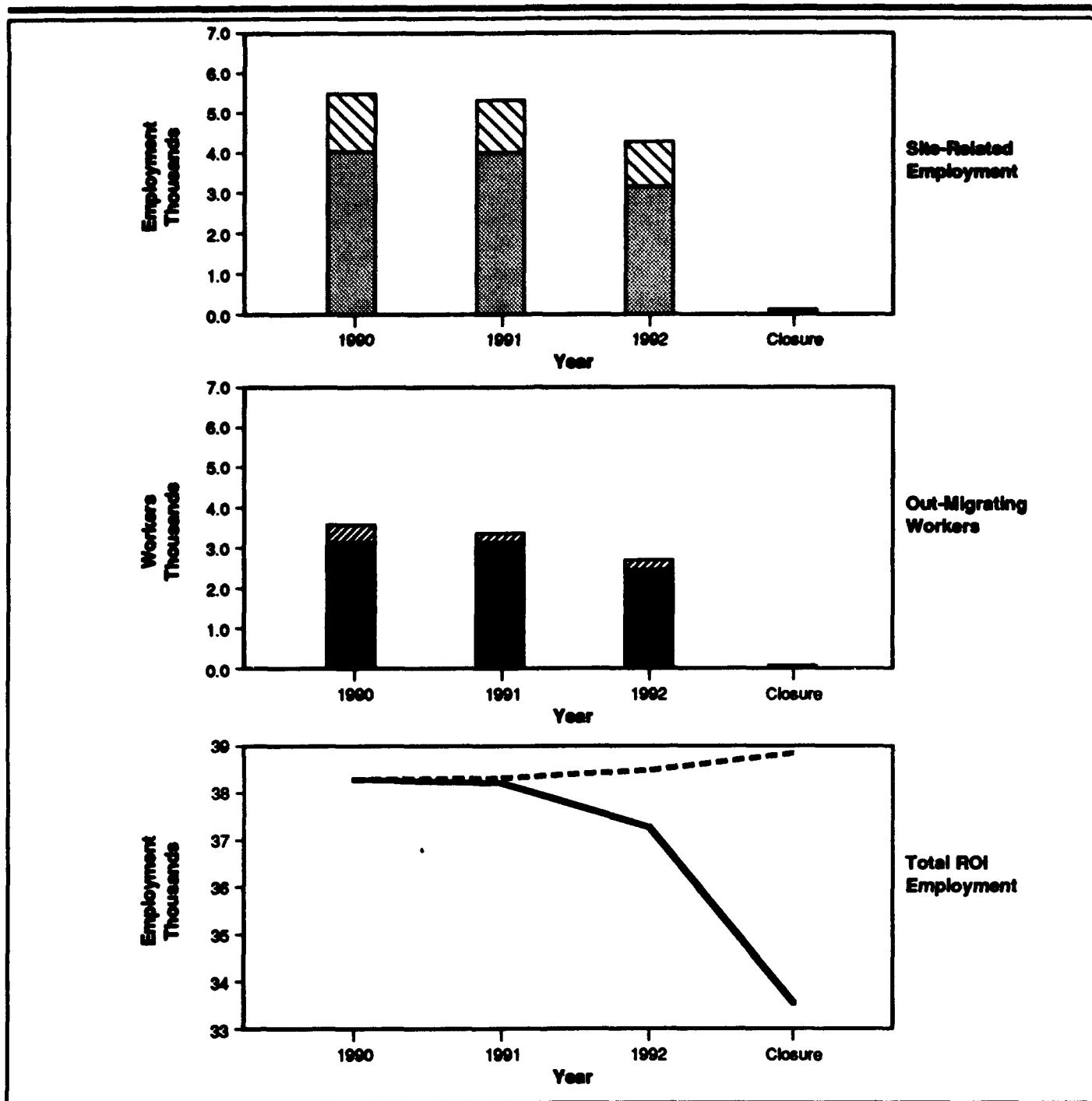
Total Employment = 38,272









**Distribution of ROI  
Jobs by Major  
Industrial Sectors,  
1990**

Source: U.S. Bureau of Economic Analysis, 1990a.

**Figure 3.2-1**



#### EXPLANATION

-  ROI Direct Employment
-  ROI Secondary Employment
-  Military Employment
-  Civilian Employment
-  Actual & Closure Projection
-  Assumed No Base Closure

Note: Closure represents June 1993 conditions.

#### ROI Site-Related and Total Employment Projections

Figure 3.2-2

**Table 3.2-2. Wurtsmith AFB Employment, FY 1987-1991**

Employment Category	1987	1988	1989	1990	1991
Military personnel	3,368	3,225	3,239	3,062	3,052
Civilian personnel	718	691	700	907	878
Appropriated fund	423	381	404	436	361
Nonappropriated fund/base exchange	295	310	296	286	340
Contract civilians	NA	NA	NA	180	170
Private business on base	NA	NA	NA	5	7
Total employment	4,086	3,916	3,939	3,969	3,930

Notes: NA = Not applicable since these activities did not exist on the base prior to 1990. Employment data shown in Table 3.2-2 represent personnel as of September of each fiscal year; therefore, these data are not directly comparable with annual average estimates shown in Table 3.2-1.

Sources: U.S. Air Force, 1987, 1988, 1989b, 1990c, 1991.

(9.4 percent) during this period. The number of civilian personnel at the base increased by 160 (22.3 percent) during the same period.

In 1990, military jobs at Wurtsmith AFB represented 90.6 percent of the 3,378 military jobs in the ROI. Other military jobs in the ROI were Reserve and Air National Guard personnel. This sector excludes civilian jobs on a military base. Overall, military jobs constituted 8.8 percent of all the jobs in the region in 1990. Due to the presence of the base, the percentage of total jobs provided by the military sector within the ROI historically has been more than four times the percentage for the nation (Table 3.2-1). In Iosco County military jobs represented 21.9 percent of all jobs in 1990.

The military sectors for both the ROI and the nation decreased steadily between 1970 and 1990. Military jobs comprised 15.3 percent of all ROI jobs in 1970, compared to 8.8 percent in 1990. Two factors contributed to the decrease in the region's share of military employment: (1) the number of military jobs decreased by 701 between 1970 and 1990; while (2) over the same period there was a substantial increase in non-military jobs, from 22,659 in 1970 to 34,894 in 1990 (including both private sector jobs and civilian jobs within federal, state, and local governments). The number of military jobs in the ROI during the past two decades decreased at almost the same rate (0.9 percent per year) as the national trend (1.0 percent per year).

Total base payrolls in FY 1991 were \$95,909,000, having increased by \$22,990,000 between FY 1987 and FY 1991 (Table 3.2-3). About 78 percent of the growth in total base payroll was attributed to military personnel. Total base payroll increased at an average rate of 7.1 percent

**Table 3.2-3. Wurtsmith AFB Payrolls, FY 1987-1991 (thousands of current year dollars)**

Category	1987	1988	1989	1990	1991
Military	63,283	71,560	75,479	74,690	81,219
Civilian	9,636	11,427	10,426	14,265	14,690
Appropriated fund	8,523	9,690	9,312	10,590	10,954
Nonappropriated fund and other	1,113	1,737	1,114	3,675	3,736
Total Payrolls	72,919	82,987	85,905	88,955	95,909

Notes: Monetary data shown are in thousands of current year dollars (i.e., they have not been adjusted for inflation) and, therefore, are not directly comparable with the constant-year monetary data (i.e., adjusted for inflation) presented elsewhere in this document.

Sources: U.S. Air Force, 1987, 1988, 1989b, 1990c, 1991.

per year during this 5-year period, including the pay increases. Total military payrolls increased at an average rate of 6.4 percent per year. Total civilian payrolls increased at an average annual rate of 11.1 percent.

Total annual expenditures were \$27,170,000 in FY 1991, having decreased from \$33,615,000 in FY 1987 (Table 3.2-4). During this period, construction was the largest category of expenditures at Wurtsmith AFB. Between FY 1987 and FY 1991, total expenditures fluctuated between \$35,677,000 and \$23,863,000.

**Table 3.2-4. Wurtsmith AFB Annual Expenditures, FY 1987-1991 (thousands of current year dollars)**

Expenditure Category	1987	1988	1989	1990	1991
Total construction	14,184	17,075	9,367	15,522	8,504
Total services	6,241	5,978	7,261	6,950	5,836
Commissary/base exchange	1,521	1,719	1,274	1,865	2,603
Education	2,047	2,343	2,114	2,132	2,386
Health	762	680	971	1,007	1,200
Temporary duty	64	43	229	107	49
Other	8,796	7,839	2,647	6,866	6,592
Total expenditures	33,615	35,677	23,863	34,449	27,170

Notes: Monetary data shown are in thousands of current year dollars (i.e., they have not been adjusted for inflation) and, therefore, are not directly comparable with the constant-year monetary data (i.e., adjusted for inflation) presented elsewhere in this document.

Sources: U.S. Air Force, 1987, 1988, 1989b, 1990c, 1991.

### Closure Conditions

Wurtsmith AFB military and civilian employment levels will decline as the drawdown of personnel at the base continues up to June 1993 (Table 3.2-5 and Figure 3.2-2). From FY 1990 to closure, a total of 5,390 jobs consisting of 3,062 military and 907 civilian positions would be either transferred or phased out of the regional economy, causing an indirect decrease of 1,421 additional secondary regional jobs (Table 3.2-2). By closure, direct and secondary site-related earnings levels will decline by \$113,044,000 (1989 dollars) compared to 1990 levels (Table 3.2-5).

At closure, an OL will be retained by the federal government, in a caretaker status, for an indefinite period of time. It is estimated that 50 direct jobs would be required, and related procurement for small amounts of goods and services would generate 11 secondary jobs in the regional economy. Direct earnings are projected to be \$1,018,000 with regional secondary earnings projected at \$181,000 per year.

Based on 1990 employment data, regional population projections, and the effects of base closure, regional employment is projected to decline from 38,272 in 1990 to 33,495 at closure (Table 3.2-5).

## **3.3 POPULATION**

The population effects of closure of Wurtsmith AFB were analyzed at both the regional and local levels. The ROI consists of the four counties (Alcona, Alpena, Arenac, and Iosco) identified in Section 3.2, Economic Activity. Population effects are further described based on residency patterns and the communities most affected by base closure which include the townships of Oscoda and Au Sable in Iosco County, and Greenbush Township in Alcona County.

### Recent Trends

**ROI Population.** According to final 1990 census counts, the population within the ROI was 85,890 persons. Only a slight increase (0.1 percent per year) occurred during the preceding decade. ROI population growth during the 1980s was less than the increase experienced during the 1970s (1.4 percent per year). Table 3.3-1 presents population growth trends for the counties and townships for 1970, 1980, and 1990, as well as average annual growth rates for the periods 1970 to 1980, and 1980 to 1990.

The slight growth rate experienced in the ROI from 1980 to 1990 was more than double that experienced by the state, which grew by only 0.04 percent per year. The population growth rate in the ROI, however, was far less than for the United States as a whole, which had an annual average growth of 0.9 percent between 1980 and 1990 (see Table 3.3-1).



**Table 3.2-5. ROI Employment and Earnings Projections, 1990 to Closure**  
(constant 1989 dollars)

	1990	1991	1992	Closure <sup>(a)</sup>
<b>Site-Related Employment and Earnings</b>				
<b>Base operations</b>				
Employment	5,390	5,268	4,188	0
Direct	3,969	3,930	3,124	0
Secondary	1,421	1,338	1,064	0
Earnings (\$000)	114,243	119,397	94,922	0
Direct	88,955	95,909	76,248	0
Secondary	25,288	23,488	18,674	0
<b>Operating location</b>				
Employment	0	0	0	61
Direct	0	0	0	50
Secondary	0	0	0	11
Earnings (\$000)	0	0	0	1,199
Direct	0	0	0	1,018
Secondary	0	0	0	181
<b>Total site-related projections</b>				
Employment	5,390	5,268	4,188	61
Direct	3,969	3,930	3,124	50
Secondary	1,421	1,338	1,064	11
Earnings (\$000)	114,243	119,397	94,922	1,199
Direct	88,955	95,909	76,248	1,018
Secondary	25,288	23,488	18,674	181
<b>ROI Employment</b>				
Employment projection (without closure) <sup>(b)</sup>	38,272	38,301	38,475	38,824
Employment loss (cumulative)	0	-122	-1,202	-5,329
Baseline projection (with closure) <sup>(c)</sup>	38,272	38,179	37,273	33,495
<b>Out-Migrating Workers<sup>(d)</sup></b>				
Direct	3,371	3,320	2,639	0
Military	3,062	3,052	2,426	0
Civilian	309	268	213	0
Secondary	142	134	106	0
Total	3,513	3,454	2,745	0

Notes: (a) Closure represents June 1993 conditions. ROI employment closure data are for 1994, the first full year of closure.  
(b) ROI employment projection represents hypothetical future conditions with base in operation at 1990 level. Data for 1991 were estimated from change in ROI employed labor force, based on Michigan Employment Security Commission, 1992. Data for 1992 and thereafter were developed from trend population projections prepared by Michigan Department of Management and Budget, 1985.  
(c) Employment loss is calculated as total site-related employment in 1991, 1992, and at closure minus total site-related employment in the preclosure year (1990).  
(d) Out-migrating workers are military personnel and civilian workers who are in the ROI due to their site-related employment and are projected to leave the ROI once their site-related jobs are phased out.

Sources: Michigan Department of Management and Budget, 1985; Michigan Employment Security Commission, 1991b, 1992; U.S. Air Force, 1987, 1988, 1989b, 1990c, 1991; U.S. Bureau of the Census, 1991a; U.S. Bureau of Economic Analysis, 1992b.

**Table 3.3-1. Population Trends for ROI, Counties, and Communities**

	Population			Average Annual Growth Rate	
	1970	1980	1990	1970-80(%)	1980-90(%)
Iosco County	24,905	28,349	30,309	1.3	0.6
Oscoda Township	11,758	11,386	11,958	-0.3	0.5
Au Sable Township	1,876	2,198	2,312	1.6	0.5
Rest of County	11,271	14,765	15,939	2.7	0.8
Alcona County	7,113	9,740	10,145	3.2	0.4
Greenbush Township	760	1,292	1,373	5.5	0.6
Rest of County	6,353	8,448	8,772	2.9	0.4
Alpena County	30,708	32,315	30,605	0.5	-0.5
Arenac County	11,149	14,706	14,931	2.8	0.2
ROI Total	73,875	85,110	85,890	1.4	0.1
State of Michigan	8,881,826	9,262,078	9,295,297	0.4	0.04
United States (000)	205,052	227,722	249,975	1.1	0.9

Sources: U.S. Bureau of the Census, 1972, 1982a, 1991a.

**Military Population and Retirees.** The total number of military personnel and their dependents assigned to Wurtsmith AFB was 7,107 in FY 1991, down 167 persons (2.3 percent) from the FY 1990 total of 7,274 (Table 3.3-2).

There were 508 less military personnel plus dependents (6.7 percent) in FY 1991 than in 1987.

In FY 1991, 1,994 military personnel and their 2,960 dependents resided in on-base housing (Table 3.3-2). This represented 69.7 percent of all military personnel and dependents assigned to the base, an increase over the average of 66 percent for the prior 4 years. This increase in the on-base share is consistent with a relatively stable level of occupancy of on-base family housing.

Based on 1992 zip code data (see Appendix B), the majority of military and civilian base personnel reside in Oscoda (82.4 percent), including the base, and Au Sable (7.5 percent) in Iosco County. Greenbush in Alcona County is the place of residence of 3 percent of base personnel.

Military retirees in the area numbered 1,920 in FY 1990 and 2,095 in FY 1991 (Table 3.3-2). The number of retirees fluctuated between 1,920 and 2,095 during the period FY 1987 through FY 1991.

**Table 3.3-2. Military Population and Housing, Wurtsmith AFB**

Category	FY 87	FY 88	FY 89	FY 90	FY91
<b>Military personnel</b>					
Living on base	1,961	2,165	2,063	1,915	1,994
Living off base	1,407	1,060	1,176	1,147	1,058
<b>Military dependents</b>					
Living on base	2,944	3,005	2,772	2,852	2,960
Living off base	1,303	1,314	1,169	1,360	1,095
<b>Total military personnel and dependents</b>	<b>7,615</b>	<b>7,544</b>	<b>7,180</b>	<b>7,274</b>	<b>7,107</b>
 <b>Military retirees</b>	 1,920	 1,971	 2,009	 1,920	 2,095
 <b>Housing assets</b>					
Family housing units	1,349	1,342	1,342	1,342	1,342
Unaccompanied quarters					
Dormitory facilities	17	16	11	11	13
Bed capacity	1,205	1,028	998	N/A	1,077

Note: N/A = Not available.

Sources: U.S. Air Force, 1987, 1988, 1989b, 1990c, 1991.

The number of site-related employees, their dependents, plus military retirees and their dependents was estimated at 17,889 persons in 1990 (Table 3.3-3). This total included 7,274 military personnel plus dependents, 6,775 direct and secondary civilian workers and their dependents, and 3,840 retired military personnel and their dependents.

#### Closure Conditions

**Site-Related Population.** Site-related population represents all direct and secondary workers, their dependents, and military retirees and dependents residing in the region as a result of base operations. Site-related population is projected to decrease to 3,599 at closure as the number of jobs associated with the base declines (see Table 3.3-3). The total at closure includes 3,422 retirees and their dependents. The balance are projected to be direct and secondary civilian workers associated with OL activities, plus their dependents.

**Out-Migrating Population.** Based on 1990 employment levels, a total of 9,354 site-related employees are expected to leave the ROI after their jobs are phased out. Under closure conditions, 7,274 active duty military personnel and their dependents are expected to be transferred out of the ROI to other assignments (Table 3.3-4). In addition, 60 percent, or 762, of

**Table 3.3-3 Site-Related Population, 1990 to Closure**

	1990	1991	1992	Closure <sup>(a)</sup>
<b>Persons by Labor Category</b>				
Military	7,274	7,107	5,705	0
Civilians	6,775	6,449	5,178	177
Direct	2,639	2,555	2,051	146
Secondary	4,136	3,894	3,127	31
Retired military	3,840	4,190	4,190	3,422 <sup>(b)</sup>
ROI total	17,889	17,746	15,073	3,599
<b>Persons by Location</b>				
Iosco County	11,997	11,849	9,769	1,174
Oscoda Township	8,805	8,751	7,096	358
Au Sable Township	1,452	1,365	1,119	122
Rest of County	1,740	1,733	1,554	694
Alcona County	2,703	2,645	2,227	485
Greenbush Township	801	769	631	75
Rest of County	1,902	1,876	1,596	410
Alpena County	2,189	2,231	2,104	1,305
Arenac County	1,000	1,021	973	635
ROI total	17,889	17,746	15,073	3,599

Notes: (a) Closure represents June 1993 conditions.

(b) Represents reduction from 1992 level by 20 percent of preclosure level (1990) retirees.

Sources: U.S. Air Force, 1990c, 1991, 1992.

total appropriated fund civilian personnel and their dependents are projected to leave the area. Most appropriated fund civilians are long-term civil servants who can transfer to other government agencies. Many are also eligible for relocation assistance and, thus, more likely to leave the area.

A total of 550, or 10 percent, of other direct (nonappropriated fund, private business, contract civilian, and base exchange) and secondary civilian workers and their dependents are expected to leave due to closure. The remaining 90 percent of direct and secondary civilian workers and their dependents are expected to remain in the ROI and seek other employment. It was assumed that 768 persons, or 20 percent of the military retirees and their dependents living in the area, would choose to leave after the base closed due to the loss of retirement benefit services. A detailed analysis of the out-migrating population assumptions is given in Appendix B and in An Advisory Committee of Oscoda Residents, 1990.

Some of the civilians who would otherwise leave upon closure of the base are expected to become part of the OL during the maintenance and disposal

**Table 3.3-4. Regional Population Projections, 1990 to Closure**

	1990	1991	1992	Closure <sup>(a)</sup>
<b>Migratory Population Changes<sup>(b)</sup></b>				
Iosco County	8,000	7,793	6,303	20
Oscoda Township	6,814	6,739	5,422	12
Au Sable Township	737	642	520	4
Rest of County	449	412	361	4
Alcona County	788	705	585	10
Greenbush Township	307	271	220	3
Rest of County	481	434	365	7
Alpena County	387	374	358	2
Arenac County	179	173	167	0
ROI total	9,354	9,045	7,413	32
<b>ROI Population</b>				
<b>Without closure</b>				
Iosco County	30,209	30,261	30,314	30,418
Oscoda Township	11,958	11,960	11,962	11,966
Au Sable Township	2,312	2,316	2,321	2,329
Rest of County	15,939	15,985	16,031	16,123
Alcona County	10,145	10,260	10,375	10,606
Greenbush Township	1,373	1,396	1,420	1,466
Rest of County	8,772	8,864	8,955	9,140
Alpena County	30,605	30,623	30,641	30,678
Arenac County	14,931	15,138	15,345	15,759
ROI total	85,890	86,282	86,675	87,461
<b>Closure effects</b>				
Iosco County	0	-208	-1,697	-7,980
Oscoda Township	0	-75	-1,391	-6,802
Au Sable Township	0	-95	-217	-733
Rest of County	0	-38	-89	-445
Alcona County	0	-83	-203	-778
Greenbush Township	0	-37	-88	-304
Rest of County	0	-46	-115	-474
Alpena County	0	-13	-29	-385
Arenac County	0	-5	-12	-179
ROI total	0	-309	-1,941	-9,322
<b>With closure</b>				
Iosco County	30,209	30,053	28,617	22,438
Oscoda Township	11,958	11,885	10,571	5,164
Au Sable Township	2,312	2,221	2,104	1,596
Rest of County	15,939	15,947	15,942	15,678
Alcona County	10,145	10,177	10,172	9,828
Greenbush Township	1,373	1,359	1,332	1,162
Rest of County	8,772	8,818	8,840	8,666
Alpena County	30,605	30,610	30,612	30,293
Arenac County	14,931	15,133	15,333	15,580
ROI total	85,890	85,973	84,734	78,139

Notes: (a) Closure represents June 1993 conditions.  
 (b) Migratory population represents those site-related employees, dependents, and retirees living in the region who are projected to leave the ROI once the site-related jobs are phased out. All other site-related employees, dependents, and retirees are assumed to remain in the region after base closure.

Sources: Michigan Department of Management and Budget, 1985; U.S. Air Force, 1990c, 1991; U.S. Bureau of the Census, 1991a.

of the base property and would remain in the area until disposal of the base. Of the 17,889 site-related population associated with operation of the base in 1990, a total of 9,322 persons (employees, retirees, and dependents) are projected to leave the region by the time the base closes in June 1993 (Table 3.3-4) and the balance of 8,567 persons is projected to remain in the ROI.

Based on the residential distribution of persons leaving the region shown in Table 3.3-4, Iosco County will experience the greatest loss in population (7,980 persons), and Oscoda Township will have a loss of 6,802 persons, including the on-base population. Alcona County will lose 778 persons followed by Au Sable Township with 733 persons, and Greenbush Township with 304 persons.

**ROI Population with Base Closure.** The population in the ROI was projected to have increased from its 1990 level of 85,890 persons to 87,461 persons by the end of 1993 had the base remained open during this period (see Table 3.3-4). This trend projection is based on prior forecasts prepared by the state of Michigan. As Wurtsmith AFB draws down their mission, population in the ROI will decline to 78,139 at closure.

### **3.4 HOUSING**

#### **Recent Trends**

**Housing Stock.** The number of housing units (including both seasonal and year-round units) in the four-county ROI, excluding those on Wurtsmith AFB, totaled 51,924 in 1990 (Table 3.4-1), representing an average annual increase of 0.8 percent from the 47,725 units in the ROI in 1980. This growth in the housing stock was slightly greater than the Michigan average rate of 0.7 percent and twice the United States rate of 0.4 percent for the same period.

The total number of housing units increased in all four ROI counties between 1980 and 1990 (Table 3.4-1). The total number of off-base units in Iosco County was 18,188 in 1990, an increase from 16,677 in 1980. In Oscoda there were 4,607 off-base housing units in 1990, an increase from 4,246 in 1980. The total number of Au Sable Township housing units was 1,559 in 1990, an increase from 1,206 in 1980. The number of units in Greenbush totaled 1,437 in 1990, a slight decrease from 1,445 in 1980.

Seasonal/vacation housing accounted for 36 percent of the total 51,924 housing units in the ROI in 1990. Although this housing is listed as vacant by the U.S. Bureau of the Census, this housing is not counted as vacant-for-sale or vacant-for-rent, and thus would not affect the ROI vacancy rate. For this reason, seasonal/vacation housing is treated separately from the permanent off-base housing stock.

**Table 3.4-1. Housing Units and Vacancies for the Wurtsmith AFB ROI: 1980, 1990**

County and Community	Total Off-Base Housing Units		Average Growth Rate (%/yr)	Vacancy Rates (%) <sup>m</sup> 1990			
	1980	1990		1980	Owner	Renter	Avg.
Iosco County <sup>m</sup>	16,677	18,188	0.9	5.5	3.9	10.9	5.6
Oscoda Township <sup>m</sup>	4,246	4,607	0.8	10.1	2.8	15.4	7.1
Au Sable Township	1,206	1,559	2.6	5.0	13.8	14.3	13.9
Rest of County	11,225	12,022	0.7	3.5	2.8	6.7	3.6
Alcona County	9,376	10,414	1.1	7.5	3.0	12.4	4.4
Greenbush Township	1,445	1,437	-0.1	16.4	4.9	16.0	7.2
Rest of County	7,931	8,977	1.2	5.9	2.6	11.5	3.9
Alpena County	13,977	14,431	0.3	3.8	1.0	6.6	2.3
Arenac County	7,695	8,891	1.5	2.9	2.2	6.4	3.0
ROI total <sup>m</sup>	47,725	51,924	0.8	4.7	2.4	8.7	3.8
State of Michigan (000)	3,590	3,848	0.7	7.1	1.3	7.2	4.4
United States (000)	88,411	91,947	0.4	7.1	2.1	8.5	3.0

Notes: (a) 1980 and 1990 averages estimated as weighted averages of owner and renter vacancy rates. Nonseasonal units consist of owner-occupied and renter-occupied units, plus vacant for-rent and vacant for-sale units. 1980 vacancy rates were calculated using comparable data for that year.  
 (b) Wurtsmith AFB housing stock of 1,329 units (1990 census) was excluded from the calculations for this area. The ERIS figure is 1,342 for 1990.

Sources: U.S. Bureau of the Census, 1982b, 1991a.

**Wurtsmith AFB Housing Stock.** In 1991, Wurtsmith AFB contained 1,342 family housing units in its inventory (see Table 3.3-2). Of these, 1,248 were in the southeast portion of the base just below Perimeter Road. The remaining 94 units were situated in the east-central section of the base adjacent to the eastern border. The 13 dormitory facilities on Wurtsmith AFB accommodate 1,077 persons (see Table 3.3-2).

**ROI Vacancy Rates.** The 1990 housing vacancy rate in the ROI, adjusted to exclude seasonal vacancies, was 3.8 percent (Table 3.4-1). This was lower than the 1980 rate of 4.7 percent.

Vacancy rates for individual ROI counties and townships are shown in Table 3.4-1. Iosco and Alcona counties had 1990 vacancy rates of 5.6 percent and 4.4 percent, respectively. Oscoda's 1990 vacancy rate was 7.1 percent; Au Sable had a vacancy rate of 13.9 percent; and Greenbush had a vacancy rate of 7.2 percent.

Vacancy rates for rental housing in the ROI in 1990 were higher than for the owner housing stock (see Table 3.4-1). This was the case for the state and nation as well. The 1990 ROI average vacancy rate of 3.8 percent represented a composite of a lower (2.4 percent) owner vacancy rate and a

higher (8.7 percent) renter vacancy rate. These vacancy rates exclude seasonal vacancies. The composite 1990 vacancy rate, calculated by including seasonally vacant units, was 38.3 percent.

**Housing Costs and Tenure.** The median value of ROI owner-occupied housing in 1990 was \$44,397 (Table 3.4-2). This represented an average annual increase of 3.3 percent from the 1980 ROI value of \$31,990. The 1990 median home value in the ROI was 73.3 percent of the state value and 56.1 percent of the national value. The 3.3 percent average annual increase from 1980 to 1990 was well below the average of 4.5 percent per year for the state and 5.3 percent annually for the nation.

**Table 3.4-2. Housing Tenure, Median Value, and Median Contract Rent for the Wurtsmith AFB ROI: 1980, 1990**

Area	1980 <sup>(a)</sup>			1990 <sup>(a)</sup>		
	Percent Owner-Occupied <sup>(c)</sup>	Median Value <sup>(d)</sup>	Median Contract Rent <sup>(e)</sup>	Percent Owner-Occupied	Median Value <sup>(f)</sup>	Median Contract Rent <sup>(g)</sup>
Iosco County <sup>(h)</sup>	42.8	31,300	144	43.6	47,400	222
Oscoda Township <sup>(h)</sup>	40.6	36,700	137	43.5	53,300	213
Au Sable Township	53.6	31,200	146	45.9	47,200	297
Rest of County	42.4	29,361	115	43.3	45,157	214
Alcona County	34.7	32,500	136	35.4	48,200	244
Greenbush Township	30.0	38,600	146	33.6	54,800	281
Rest of County	35.5	31,563	134	35.6	47,204	235
Alpena County	64.8	32,200	162	64.1	41,600	245
Arenac County	57.2	32,300	134	51.7	41,800	252
ROI Average <sup>(h)(i)</sup>	49.9	31,990	143	49.0	44,397	238
State of Michigan	67.3	39,000	196	67.7	60,600	343
United States	64.4	47,200	198	64.2	79,100	374

- Notes: (a) 1980 figures refer to occupied, year-round units.  
 (b) 1990 figures refer to occupied, total housing units.  
 (c) Percent owner occupied was calculated as owner-occupied housing units divided by total housing units.  
 (d) Owner-occupied units, 1980 dollars.  
 (e) Renter-occupied units, 1980 dollars (per month).  
 (f) Owner-occupied units, 1990 dollars.  
 (g) Renter-occupied units, 1990 dollars (per month).  
 (h) Wurtsmith AFB housing stock was excluded from the calculations for this area.  
 (i) Median value and median contract rent for this area were estimated using weighted averages. Weights were based on the number of owner-occupied and renter-occupied units, respectively, in each county.

Sources: U.S. Bureau of the Census, 1982a, 1982b, 1991a.



In 1980, median housing values in Alcona County were slightly higher than in the three other counties in the ROI (Table 3.4-2). Iosco County had the lowest median housing values. Regional housing values increased steadily from 1980 to 1990.

The proportion of occupied housing which was owner occupied in 1990 averaged 49.0 percent in the ROI, a slight reduction from the 1980 share of 49.9 percent.

**Housing Construction Trends.** Data on new housing units authorized by building permits in the two counties (Iosco and Alcona) most affected by activities at Wurtsmith AFB are presented in Table 3.4-3. New authorized units averaged 158 per year in Iosco County from 1980 through 1990.

**Table 3.4-3. Total Housing Units Authorized by Building Permits for Selected Portions of the Wurtsmith AFB ROI**

	1980	1985	1990	Average, 1980-1990*
Iosco County	98	145	230*	158
Alcona County	2*	82*	90	58
Alpena County	62	19	60	47
Arenac County	51	N/A	6	29

Notes: N/A = Not available. Building permit data were unavailable for Au Sable, Greenbush, and Oscoda townships during this time period.  
(a) Number reflected is a partial total for that county, since one or more townships did not submit annual reports; or (2) if on list for monthly reporting, reports were received for less than 9 months.

Sources: U.S. Bureau of the Census, 1981, 1986, 1991b.

Much of the construction in Iosco County during the 1980s consisted of single-family units. Construction of multi-family units peaked in the late 1980s and dropped to zero by 1990 (U.S. Bureau of the Census, 1982b, 1986, 1991b). About half of the present housing stock was constructed in the last 30 years.

#### Closure Conditions

**Migratory-Related Housing Demand.** The effects on housing demand from closure of the base are presented in Table 3.4-4. These represent the number of units needed by the out-migrating site-related population, through the date of closure. This indicator represents the change in ROI housing demand due to closure of the base. Units occupied by these households are projected to be vacant as their occupants move out.

**Table 3.4-4. Projected Housing Demand, 1990 to Closure**

	1990	1991	1992	Closure
Iosco County	2,749	2,678	2,166	6
Oscoda Township	2,342	2,316	1,864	3
Au Sable Township	253	220	178	2
Rest of County	154	142	124	1
Alcona County	270	242	201	3
Greenbush Township	105	93	76	1
Rest of County	165	149	125	2
Alpena County	133	129	123	1
Arenac County	62	59	57	0
ROI Total	3,214	3,108	2,547	10

Notes: Data are migratory-related housing demand and reflect demand from site-related population, excluding persons expected to remain in the area after the base closes. Closure represents June 1993 conditions.

ROI housing demand, both on base and off base, is expected to decrease from 3,214 units in 1990 to 10 units at closure. The small housing demand at closure is associated with the few caretaker personnel expected to relocate in the region. Iosco County will experience most of this decrease. Wurtsmith AFB on-base demand will fall to zero at closure. Base closure is projected to cause demand in Oscoda Township to decline from 2,342 units in 1990 to 3 units at closure. Au Sable Township demand associated with the base will decrease from 253 units in 1990 to 2 units at closure. Greenbush Township's demand associated with the base will fall from 105 units to 1 unit.

**ROI Housing Demand with Base Closure.** The reduction in housing demand, excluding on-base unit demand, is estimated at 1,565 units. Total ROI nonseasonal off-base housing demand is projected to decline from 33,294 in 1990 to 31,729 at closure. The change in housing demand represents an increase in vacant units in the ROI. ROI vacant units prior to closure are estimated to number 1,263, or 3.8 percent of the nonseasonal housing stock. Total vacant units at closure are projected at 2,828, which represents a vacancy rate of 8.5 percent, more than twice the preclosure vacancy rate of 3.8 percent. Vacancy rates at closure are expected to be highest in the townships nearest the base. Oscoda's vacancy rate would increase to nearly 30 percent of the nonseasonal off-base housing stock. Au Sable's vacancy rate would increase to more than 36 percent, and Greenbush Township's vacancy rate would increase to more than 23 percent.

Reductions in housing demand and increases in housing vacancy rates are expected to cause a decline in home prices and rents and a lengthening of the time required to sell or lease residential property.

### **3.5 PUBLIC SERVICES**

The ROI for studying the effects on public services includes the areas within the region that will realize the greatest population effects and, therefore, the greatest effects on the provision of public services due to the closure and potential reuse of the base. These jurisdictions include the Iosco and Alcona county governments; Oscoda, Au Sable, and Greenbush township governments; and Oscoda Area Schools and Tawas Area Schools.

The key public services examined in this analysis are local government administration, public education, police and fire protection, and health care. In the Wurtsmith AFB region, providers of these services are county and township governments, public school districts, police and fire departments, and hospitals and medical clinics. The following section presents a discussion of the recent trends and closure conditions for each of these major public services in the ROI.

The levels of general public service are usually determined by the ratio of employees (e.g., municipal employees, sworn officers, professional fire fighters) to serviced population, and by student/teacher ratios at the primary and secondary public school levels. In addition, staffing per area of service (e.g., per square mile) is used where jurisdictional population is unknown or where effects of boundary changes need to be assessed. Minimum staffing requirements were addressed based on interviews with key local government personnel.

#### **3.5.1 Governmental Structure**

##### **Recent Trends**

**Iosco County.** Iosco County was chartered in 1857 by the Michigan legislature granting the Board of Commissioners fundamental powers as the county's legislative and executive body. The board consists of seven commissioners, one from each of seven districts, who are elected to 2-year terms; one commissioner serves as board chairman. Each of the districts is apportioned based on population (Schirmer, 1992).

Iosco County administers more than 20 major services, including building inspection, road work, public protection, judicial services, health care, and social services. The county employs approximately 122 full- and part-time personnel (109 full time equivalents [FTE]) throughout the county, leading to an overall level of service of 4.3 FTE personnel per 1,000 population living off base. Of the county's various departments, the Iosco County Jail, the District Court, and Emergency Medical Services are the largest employers (Krebel, 1992).

**Oscoda Township.** Oscoda became a charter township in 1970, having previously been a general law township. The charter grants the township Supervisor and Board of Trustees principal responsibilities for legislating ordinances and setting policy. The Board of Trustees consists of four elected trustees. The township provides administration, planning and building services, recreation and community services, public works, police, fire, library, and development services. The township employs approximately 23 full-time people and maintains a level of service of 3.3 FTE personnel per 1,000 people living off base (Wright, 1992).

**Au Sable Township.** Au Sable became a charter township in 1985. Like other township governments, Au Sable is governed by a township Supervisor and a Board of Trustees. Due to the relatively small size of the township, Au Sable contracts with outside service providers for police protection, fire protection, and public works. The township government provides basic administrative services with four part-time employees including the township supervisor, a clerk, a treasurer, and an assessor. All other employees provide services on a part-paid basis, i.e., paid when services are rendered (Mathews, 1992).

**Alcona County.** Alcona County was created in 1869 when its charter was approved by the Michigan legislature granting the Board of Commissioners fundamental powers as the county's legislative and executive body. The board consists of five commissioners who are elected from five districts for 2-year terms; one commissioner serves as board chairman. Each of the districts is apportioned based on population.

Alcona County administers primary services, including road work, public protection, emergency medical care, and government administration. The county employs approximately 74 full- and part-time personnel (61 FTE) leading to an overall level of service of 6.0 FTE personnel per 1,000 population. Of the county's various departments, the Alcona County Jail, the District Court and Probate Court, and the County Clerk's Office are the largest employers (Huffine, 1992).

**Greenbush Township.** Greenbush, created in 1868, is a general law township. The township Supervisor, along with a Board of Trustees and several standing committees for planning, zoning, recreation, and public works, provides township residents with services. The township fire department is all volunteer, and police protection and road maintenance are provided by Alcona County. The township employs a supervisor, clerk, treasurer, and assessor to provide services on a part-time basis. Other services are provided by part-paid employees (paid when service is rendered) (Roddy, 1992).

### Closure Conditions

Changes to local government employment arising from closure of Wurtsmith AFB are presented in Table 3.5-1. Effects attributable to changes in demand for local government services would follow the pattern of population out-migration (see Table 3.3-4) and would primarily affect government employment for Iosco and Alcona counties and Oscoda Township.

**Table 3.5-1. Migratory-Related Demand for Local Government Employees, 1990 to Closure**

	1990	1991	1992	Closure
Iosco County	12	10	8	0
Oscoda Township	7	6	5	0
Alcona County	4	4	3	0
Total	23	20	16	0

Notes: Migratory-related local government employees represent the effects of migratory-related population changes on the number of government employees required to maintain level-of-service ratios. These numbers include only off-base population out-migration from affected communities. Data are rounded to the nearest whole employee. Closure represents June 1993 conditions.

Due to the loss of population from base closure, in Iosco and Alcona counties and the townships of Oscoda, Au Sable, and Greenbush, decreased staffs could maintain 1992 levels of service. Projected declining populations in both Iosco and Alcona counties may result in county staff reductions of about 12 and 4 positions, respectively, while still maintaining 1992 public service levels of 4.3 and 6.0 per 1,000 population, respectively. In Oscoda Township, total staff levels could be reduced by up to seven positions to maintain 1992 level-of-service ratios.

These reductions would decrease local government staff levels at closure to 97 FTE employees in Iosco County, 57 FTE employees in Alcona County, and 16 FTE employees in Oscoda Township. However, reductions in government services personnel in small rural jurisdictions such as Au Sable and Greenbush are less likely, since many of the employees are already part-time or part-paid. Existing staff levels could probably be maintained with reductions in service hours proportional to population losses.

### **3.5.2 Public Education**

#### Recent Trends

Oscoda Area Schools and Tawas Area Schools provide public elementary and secondary education to the majority of the students who are

dependents of Wurtsmith AFB personnel (Figure 3.5-1). These school districts have enrollments which are most affected by military and civilian personnel changes at Wurtsmith AFB. There are no schools on Wurtsmith AFB.

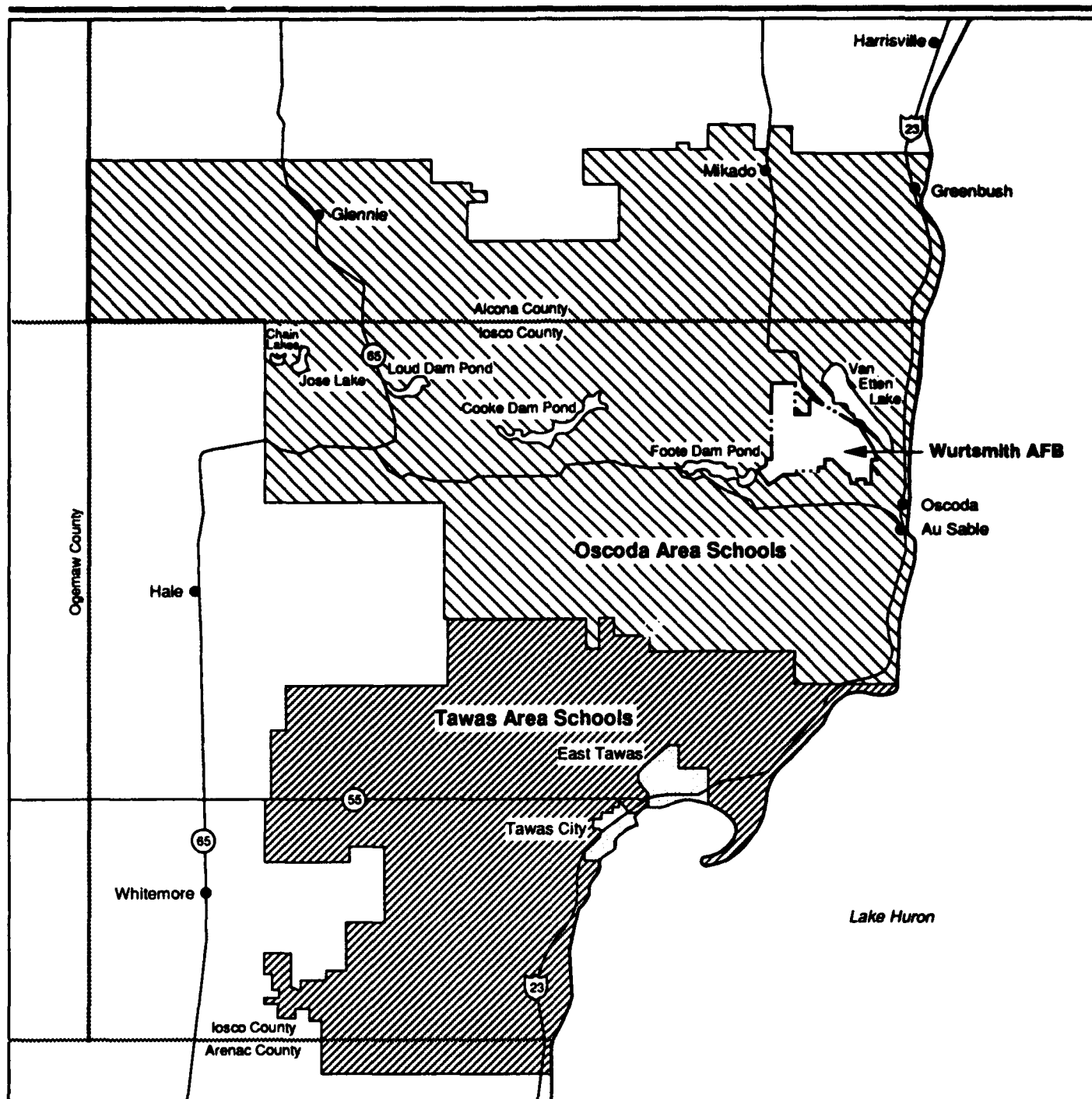
In 1990, the ratio of students to teachers in the ROI was 19.3 (Table 3.5-2), compared to a state average of 21.0 (Michigan Department of Education, 1991) and a national average of 17.2 (National Center for Education Statistics, 1991). Between 1989 and 1991, total enrollments in the two districts increased at an average annual rate of about 2.6 percent (Table 3.5-3).

**Table 3.5-2. Public School District Enrollment (K-12) and Student/Teacher Ratios**




	Enrollment	Teachers	Student/ Teacher
<b>1989</b>			
Oscoda Area Schools	3,211	178	18.0
Tawas Area Schools	1,683	87	19.3
Total	4,894	265	18.5
<b>1990</b>			
Oscoda Area Schools	3,389	179	18.9
Tawas Area Schools	1,751	87	20.1
Total	5,140	266	19.3
<b>1991</b>			
Oscoda Area Schools	3,382	182	18.6
Tawas Area Schools	1,768	91	19.4
Total	5,150	273	18.9

Sources: Gunnell, 1992; McLean, 1992; Michigan Department of Education, 1991; Oscoda Area Schools, 1992; Tawas Area Schools, 1992.

**Oscoda Area Schools.** The Oscoda Area Schools district operates seven schools in Iosco County and portions of Alcona County, including five elementary schools, one middle school, and one high school. With 3,382 students enrolled in Fall 1991, it is the largest school district in Iosco County. This school district provides public education to military family housing residents at Wurtsmith AFB. Enrollments, teaching staff, and service ratios are presented in Table 3.5-2. With a 1991 teaching staff of 182 personnel, the student-teacher ratio was 18.6 for the 1991-1992 school year.



# EXPLANATION

-  Oscoda Area Schools
-  Tawas Area Schools
-  Base Boundary

## School District Boundaries

Figure 3.5-1

**Table 3.5-3. Historic Fall Enrollments (K-12) in Public School Districts in Wurtsmith AFB Area: 1989-1991**

School District	1989	1990	1991	Total % Change	Average Annual % Change
Oscoda Area Schools	3,211	3,389	3,382	5.3	2.6
Tawas Area Schools	1,683	1,751	1,768	5.1	2.5
<b>Total</b>	<b>4,894</b>	<b>5,140</b>	<b>5,150</b>	<b>5.2</b>	<b>2.6</b>

Sources: Oscoda Area Schools, 1992; Tawas Area Schools, 1992.

Schools within the district are operating at or below design capacity of approximately 4,000 students. With a 1991-1992 school year enrollment of 3,382 students, the district does not anticipate the need for any additional classrooms.

The majority of dependents of Wurtsmith AFB personnel attend Oscoda Area Schools. In Fall 1991, enrollments consisted of 1,731 dependents of military and civilian personnel (Table 3.5-4). Wurtsmith AFB-related enrollments have remained at about 51 percent of total district enrollment from 1989 to 1991.

**Table 3.5-4. Enrollments Related to Wurtsmith AFB**

Enrollment Breakdown	1989	1990	1991
<b>Oscoda Area Schools</b>			
Total enrollment	3,211	3,389	3,382
Military dependents	1,385	1,462	1,459
Civilian dependents	258	272	272
Estimated secondary dependents	530	556	543
Total AFB-related dependents	2,173	2,290	2,274
AFB-related percentage of total enrollment	67.7	67.6	67.2
<b>Tawas Area Schools</b>			
Total enrollment	1,683	1,751	1,768
Military dependents	31	32	32
Civilian dependents	23	24	25
Estimated secondary dependents	74	82	76
Total AFB-related dependents	128	138	133
AFB-related percentage of total enrollment	7.6	7.9	7.5

Note: AFB-related enrollment figures are estimates from the respective school districts. Civilian enrollment is based on direct federal employees including both appropriated and nonappropriated fund civilians.

Sources: Oscoda Area Schools, 1992; Tawas Area Schools, 1992.



**Tawas Area Schools.** The Tawas Area Schools district provides primary and secondary public education services for the communities of East Tawas, Tawas, and portions of several townships with two elementary schools, one junior high school, and one high school. Total district enrollment in Fall 1991 was 1,768 students (see Table 3.5-4).

Total enrollment in the district increased gradually during the latter part of the 1980s. Enrollment has risen from 1,683 in 1989 to 1,768 in 1991, at an annual rate of 2.5 percent, or a total of 5.1 percent for the last 3 school years (see Table 3.5-3). Of the 1,768 students enrolled in the district in Fall of 1991, approximately 57 of the students, or 3 percent, were dependents of personnel (military and civilian) employed at Wurtsmith AFB (see Table 3.5-4). The student/teacher ratio was 19.4 for the 1991-1992 school year (see Table 3.5-2).

#### Closure Conditions

Potential effects to public school enrollments and teaching staff due to base closure are presented in Table 3.5-5. Oscoda Area Schools would experience a 51.2 percent enrollment decrease due to base closure, and Tawas Area Schools would experience a 3.2 percent enrollment decrease.

**Table 3.5-5. Migratory-Related Enrollment and Teaching Staff Effects**

	1990	1991	1992	Closure
<b>Student Enrollment Effects</b>				
Oscoda Area Schools	1,718	1,660	1,333	6
Tawas Area Schools	56	53	43	1
Total	1,774	1,713	1,376	7
<b>Teaching Staff Effects</b>				
Oscoda Area Schools	91	88	71	0
Tawas Area Schools	3	2	2	0
Total	94	90	73	0

Notes: Effects of migratory-related population changes on student enrollments and teaching staff requirements. Data are rounded to the nearest whole person; therefore, zeros may equal less than one person. Closure represents June 1993 conditions.

By June 1993, the enrollments related to base operations would decline from 1,774 to 7 students, since OL-related employment at closure will generate only minimal enrollments. This would reduce total enrollment in Oscoda Area Schools from 3,389 to 1,677 students and in Tawas Area Schools from 1,751 to 1,696 students. Corresponding reductions in base-related demand for teachers and facilities use would be expected to

accompany these projected enrollment decreases. The number of teachers in Oscoda Area Schools would decrease from 179 in 1990 to 88 at closure. The number of teachers in Tawas Area Schools would decrease from 87 in 1990 to 84 at closure. These staffing changes are based on changes in total enrollment and do not account for distribution of effects at the grade level. For Oscoda and Tawas Area Schools, enrollment effects of base closure may be dispersed by grade level to the extent that reductions in teaching staff may not be required or practicable.

### **3.5.3 Police Protection**

#### **Recent Trends**

Police protection for Wurtsmith AFB is provided by security forces from the base. The Oscoda Township Police Department and the Alcona County Sheriff's Department provide protection for the ROI outside the base. Au Sable Township contracts its law enforcement services with the Oscoda Township Police Department; Greenbush Township law enforcement services are covered by the Alcona County Sheriff's Department. Under the contracts, the township and county provide vehicles, officers, and staff. The Iosco and Alcona county sheriffs' departments maintain holding facilities for detainees. These facilities are located in Tawas City in Iosco County, and Harrisville in Alcona County, and serve all local law enforcement agencies in the two counties.

**Oscoda Township Police Department.** The Oscoda Township Police Department provides law enforcement and police protection services within Oscoda. The department operates out of a single police station located in Oscoda. Staff includes 11 sworn officers and 8 auxiliary non-sworn personnel. Auxiliary non-sworn personnel augment sworn officers, but do not have as much authority as a sworn officer; therefore, they were not included in the analysis. The township's level of service for police protection is 1.2 sworn officers per 1,000 population living off base in Oscoda and Au Sable townships. The department maintains five vehicles, including four marked police cruisers and one unmarked cruiser. For corrections services, the department relies on the county jail operated by the Iosco County Sheriff's Department (Lavack, 1992).

The Oscoda Township Police Department maintains mutual aid agreements with the sheriff's offices of both Iosco and Alcona counties as well as other local municipal police departments in both counties (Lavack, 1992).

**Alcona County Sheriff's Department.** Police protection in Greenbush township is provided by the Alcona County Sheriff's Department. The sheriff's department provides law enforcement and police protection services within the limits of the township consisting of approximately 22 square miles. The department operates out of a single office in Harrisville

with a staff of 11 sworn officers, 2 part-time officers (12 full-time sworn officers), and 6 auxiliary officers. The department maintains seven marked vehicles and one unmarked car. The county sheriff's level of service is 1.8 officers per 1,000 population, which equates to approximately two officers to provide services to the residents of Greenbush Township. The county operates a correctional facility which employs seven people.

**Security Police Squadron.** Law enforcement within the boundaries of Wurtsmith AFB is provided by the 379th Security Police Squadron. The squadron maintains a staff of 55 (46 are equivalent to sworn officers). The squadron operates from one station on the base with seven vehicles, including five sedans and two trucks. The squadron operates an 8-bed holding facility. The Security Police maintain a policy of cooperation with all local off-base law enforcement agencies; however, there are no formal mutual aid agreements due to separation of federal and local law enforcement jurisdictions.

#### Closure Conditions

Projected effects on police protection in the ROI resulting from base closure are presented in Table 3.5-6. Potential effects resulting from changes in demand for police protection services reflect the pattern of migratory population changes in the region. The number of sworn officers would decrease to eight in Oscoda Township Police Department, and one officer to serve Greenbush (reducing total Alcona County Sheriff staffing to 11 officers) at closure.

**Table 3.5-6. Migratory-Related Demand for Police Officers,  
1990 to Closure**

	1990	1991	1992	Closure <sup>(b)</sup>
Oscoda Township Police Dept. (includes Au Sable Township)	3	3	2	0
Alcona County Sheriff (Greenbush Township only)	1	0	0	0
<b>Total</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>0</b>

Notes: Effects of migratory-related population changes on number of sworn officers required to maintain level-of-service ratios. Data are rounded to the nearest whole police officer; thus, zeros may equal less than one person. Closure represents June 1993 conditions.

With the closure of the base, the 379th Security Police Squadron would no longer provide police protection for the base area. The site will remain fenced, and site security will be maintained by the OL. Under closure conditions the Oscoda Township Police Department would not be required to patrol the site on a regular basis; however, since the base is located

within Oscoda Township limits, the Oscoda Township Police Department would assist OL security personnel. Therefore, no additional officers are anticipated to be required to provide police protection services to the base area.

#### **3.5.4 Fire Protection**

##### **Recent Trends**

Fire protection in the Wurtsmith AFB region is provided by the base and township fire departments. Personnel in the local fire departments are all volunteer, including many who are also base fire fighters. The Wurtsmith AFB fire fighters are trained and certified to fight structural fires, address hazardous waste, handle civilian emergencies, and battle forest fires. Each fire department maintains mutual aid agreements with other fire departments in the region, including the base fire department during emergencies.

**Oscoda Township Fire Department.** The Oscoda Township Fire Department provides fire protection services for Oscoda. The department has a total of 30 state-certified volunteer fire fighters, including 6 who are also full-time fire fighters on the base. The department maintains a level of service of 3.3 fire fighters per 1,000 population living off base in Oscoda and Au Sable townships; the department maintains a service contract with Au Sable Township. The department operates one 1,000-gallon-per-minute (gpm) pumper, two 750-gpm pumpers, and one 1,000-gallon tanker from one station located in Oscoda. The Oscoda Township Fire Department maintains mutual aid/joint response agreements with all township and municipal fire departments in the region (Parsons, 1992).

**Greenbush Volunteer Fire Department.** The Greenbush Volunteer Fire Department provides fire protection, emergency medical services, and hazardous materials services for Greenbush Township. The department has 16 state-certified volunteer fire fighters, including 4 that are also full-time fire fighters at the base. These personnel provide a level of service of 11.7 fire fighters per 1,000 population. The department has one fire station located in Greenbush, and operates two 750-gpm pumpers, one 1,500-gallon water tanker, and one rescue squad. The department maintains mutual aid/joint response agreements with the fire protection squadron at Wurtsmith AFB and all fire departments serving the townships surrounding Greenbush (Kondrat, 1992).

**Wurtsmith AFB Fire Department.** The Wurtsmith AFB Fire Department (379th Civil Engineering Squadron) provides fire protection services for the base area with 69 fire fighting (49 military and 20 civilian) personnel. The squadron operates out of two fire stations with 18 pieces of major equipment, including three engines, five crash trucks, four squad/rescue

vehicles, two ramp vehicles, two command vehicles, one hazardous materials vehicle, and one water tender. The base fire department supports seven other area fire departments through mutual aid agreements. The Wurtsmith AFB Fire Department maintains several pieces of specialized fire fighting equipment that surrounding community fire departments do not have; i.e., the "jaws-of-life" rescue apparatus and a 5,000-gallon water tanker for remote rural fires.

#### Closure Conditions

Potential effects of base closure on fire protection services in the ROI are presented in Table 3.5-7. Reductions in fire fighting staff would decrease the number of volunteers to 21 in Oscoda Township Fire Department and 12 in Greenbush Volunteer Fire Department at closure. Upon closure of the base, with Wurtsmith AFB in caretaker status, the Wurtsmith AFB Fire Department would no longer provide fire protection services. Local fire districts and communities would not be able to rely on mutual aid assistance in fire protection, fire suppression, rescue, or hazardous materials emergencies from the base. At closure, an OL fire protection team would operate an interim fire department at the base using existing operations fire-fighting equipment. Mutual aid support would be provided primarily by the Oscoda Township Fire Department, and would not require any additional fire fighters.

**Table 3.5-7. Migratory-Related Demand for Fire Fighters, 1990 to Closure**

	1990	1991	1992	Closure
Oscoda Township Fire Dept. (includes Au Sable Township)	9	8	6	0
Greenbush Volunteer Fire Dept.	4	3	3	0
<b>Total</b>	<b>13</b>	<b>11</b>	<b>9</b>	<b>0</b>

Notes: Effects of migratory-related population changes on number of fire fighters required to maintain level-of-service ratios. Data are rounded to the nearest whole fire fighter, thus, zeros may equal less than one fire fighter. Closure represents June 1993 conditions.

### **3.5.5 Health Care**

#### Recent Trends

Twenty-seven acute and general care hospitals or health care facilities are licensed to provide health care services within Iosco, Alcona, Alpena, and Arenac counties. These facilities provide about 300 inpatient beds (Michigan Bureau of Health Systems, 1992). There are 81 medical doctors and surgeons, 127 registered nurses, and 144 licensed practicing nurses registered to practice in the four counties. Wurtsmith AFB also operates a

**35-bed hospital with both inpatient and outpatient service for active duty military, retirees, and dependents.**

**Community Health Care Services.** The largest inpatient health provider in Iosco County is St. Joseph's Hospital, located about 15 miles south of the base in Tawas City. This hospital is licensed for 65 beds, operates at 58-percent capacity, and provides basic acute and primary medical care, along with general and specialized medical and surgical services. It does not have an outpatient clinic. The county has two extended care nursing facilities, one mental health facility, and one old-age home/hospice facility. Iosco County Ambulance, based at St. Joseph's Hospital, provides emergency medical technicians and ambulance service for the county. Staffing in Iosco County provides a level of service of 3.6 health-care professionals per 1,000 people. Alcona County provides two nursing homes, four mental health facilities, one licensed medical clinic, and one old age home. The next closest hospitals are located in Alpena and Arenac counties, and together they provide an additional four nursing care facilities, six mental health facilities, and two old age homes. There are no licensed clinics in Iosco, Alcona, Alpena, or Arenac counties.

**Military Health Care Services.** The Wurtsmith AFB Hospital provides health care services to active-duty military personnel and their dependents, retired military personnel and their dependents, and to dependents of deceased military personnel.

Outpatient services at the Wurtsmith AFB Hospital consist of acute care, primary care, gynecology and obstetrics, physical therapy, general dentistry, and an extended care clinic. In addition, a mental health clinic, a full-service pharmacy, and medical laboratory are also located at the base.

The hospital began reducing services in April 1992, with the closure of the emergency room. Consequently, limited emergency care and trauma support are available only to active duty personnel and their dependents. Retirees and their dependents and the dependents of deceased military personnel have been directed to seek emergency medical care at St. Joseph's Hospital in Tawas City. Other DOD installations where medical care is available to active and retired military personnel include K.I. Sawyer AFB and Wright-Patterson AFB. These facilities are more than 300 miles from Wurtsmith AFB.

The closest Veterans Administration (VA) hospital is Aleda E. Lutz VA Medical Center, located in the city of Saginaw, about 90 miles south of the base. This medical center is a 135-bed inpatient facility that provides complete medical, surgical, and extended care services. It includes an outpatient medical clinic and a new 122-bed nursing care facility. In addition, medical needs that cannot be provided by the VA Medical Center can be provided by other VA medical facilities located within the state. A

satellite outpatient clinic is also available in Gaylord in Ostego County about 50 miles northwest of the base.

In addition to military health services offered through the base hospital, military personnel and dependents have access to the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). This is a co-payment medical plan, with an annual deductible, that provides payment for specific medical services to eligible dependents of active, retired, or deceased military personnel. As with many insurance plans, CHAMPUS pays approximately three-quarters of the set rate for a given medical service. Active-duty military personnel also are covered by the program for medical services not available at their base, or for emergencies. CHAMPUS is honored by hospitals, clinics, and doctors nationwide, including all the health care facilities mentioned in this report. Because there are limitations and constraints to the coverage offered by CHAMPUS, retired military personnel are encouraged to supplement this health care plan with secondary coverage.

#### Closure Conditions

At base closure, Wurtsmith AFB Hospital will be closed. The 26 acute care hospitals and health care facilities located within the ROI and various resident medical personnel in the ROI would provide medical, dental, and emergency services as required by the community. Closure of the hospital will affect the 3,422 retirees and their dependents projected to remain in the four counties because there are no other local military facilities to provide medical benefits. While veterans will not be able to use the base hospital, they will be able to continue to take advantage of the VA hospital and clinic facilities in Saginaw and Gaylord.

### **3.6 PUBLIC FINANCE**

The special characteristics of the ROI for public finance are presented below as defined in Chapter 2 as Iosco and Alcona counties; Oscoda, Au Sable, and Greenbush townships; and Oscoda Area Schools and Tawas Area Schools.

#### **3.6.1 County of Iosco**

##### Recent Trends

Services provided by Iosco County are funded principally through the county's general and special revenue funds. In FY 1991, revenues and expenditures of these funds were \$6,176,700 and \$5,964,459, respectively. The fund balance was \$1,581,041 or about 27 percent of operating expenditures (Table 3.6-1).

**Table 3.6-1. Iosco County Revenues, Expenditures, and Fund Balances, General and Special Revenue Funds, FY 1989-1991 (current dollars)**

	1989	1990	1991
<b>Revenues</b>			
Taxes	1,894,018	2,010,187	2,272,297
Licenses and permits	126,592	132,671	146,756
Federal grants	349,008	377,834	562,495
State grants	1,026,566	1,184,562	1,138,890
Contributions from local units	14,616	48,904	21,882
Charges for services	1,265,370	1,548,733	1,342,055
Fines and forfeits	299,570	342,233	303,525
Other	381,498	371,353	388,800
Total revenues	5,357,238	6,016,477	6,176,700
<b>Expenditures</b>			
Legislative	121,220	83,464	65,667
Judicial	782,421	840,548	927,394
General government	1,638,489	1,404,274	1,313,714
Public safety	1,288,810	1,168,427	1,118,228
Public works	2,036	2,532	3,179
Health and welfare	1,420,898	1,827,881	1,732,465
Recreational and cultural	530,265	572,414	591,778
Capital outlay	65,716	59,781	212,034
Debt service	9,246	0	0
Total expenditures	5,859,101	5,959,321	5,964,459
<b>Fund Balances<sup>(a)</sup></b>	<b>975,041</b>	<b>1,351,135</b>	<b>1,581,041</b>

**Note:** (a) Includes interfund transfers to and from funds other than general and special revenue funds; thus, fund balances will not total.

**Sources:** Iosco County, 1989, 1990, 1991.

The principal revenue sources of the county are taxes (37 percent of total FY 1991 general and special revenue fund collections), charges for services (22 percent of total FY 1991 collections), and state grants (18 percent of total FY 1991 collections).

The principal expenditure functions of the county are for health and welfare (29 percent of total FY 1991 expenditures), general government (22 percent of total FY 1991 expenditures), and public safety (19 percent of total FY 1991 expenditures).



Assessed valuation in the county is approximately \$474 million. General obligation bond indebtedness was \$18.5 million at the end of FY 1991.

#### Closure Conditions

Reduced site-related personal income levels, lower employment, and out-migration of 7,980 residents from 1990 levels are projected to result in reductions in general and special revenue fund revenues of \$998,043 by closure. Lower federal and state grants (\$376,778) and charges for services (\$343,287) account for about 72 percent of the lost revenues.

Losses in revenue would be partially offset by a reduction in expenditures of \$468,574. The net fiscal effect of closure is revenue shortfalls of \$529,469 annually (Table 3.6-2).

**Table 3.6-2. Net Fiscal Effects of Closure of Wurtsmith AFB on Potentially Affected Local Government Units, FY 1991 to Closure (1989 dollars)**

Jurisdiction	1991	1992	Closure
County of Iosco	-13,792	-112,525	-529,469
Township of Oscoda	-2,632	-48,807	-238,702
Township of Au Sable	-3,874	-8,942	-30,207
County of Alcona	-4,772	-11,671	-44,787
Township of Greenbush	-1,102	-2,621	-9,055
Oscoda Area Schools	-14,146	-438,396	2,187,796
Tawas Area Schools	-2,362	-8,267	-33,067

Note: Data reflect the difference in projected revenue losses less expenditure reductions.

Increases in local tax and non-tax revenue schedules and/or lower service levels may be required to maintain a balanced fiscal position at closure.

#### **3.6.2 Township of Oscoda**

##### Recent Trends

Services provided by Oscoda Township are funded principally through general and special revenue funds. In 1991, revenues and expenditures of these funds were \$1,601,126 and \$1,455,823, respectively. Fund balances were \$549,777, or about 38 percent of operating expenditures (Table 3.6-3). This was an increase over FY 1989, when fund balances were \$421,266, or about 33 percent of operating expenditures.

The principal revenue sources of the township are federal grants and state shared revenue (45 percent of total FY 1991 general and special revenue

**Table 3.6-3. Oscoda Township Revenues, Expenditures, and Fund Balances, General and Special Revenue Funds, FY 1989-1991 (current dollars)**

	1989	1990	1991
<b>Revenues</b>			
Taxes	516,585	655,238	664,478
Licenses and permits	2,681	2,024	1,150
Federal grants/state shared revenue	639,827	690,314	720,207
Charges for services	145,849	148,486	156,114
Interest earned, rents and royalties	54,613	56,763	37,553
Sale of land and other fixed assets	11,993	10,172	5,555
Other	20,573	28,804	16,069
Total revenues	1,392,121	1,591,801	1,601,126
<b>Expenditures</b>			
General government	452,537	467,728	536,949
Public safety	588,055	760,229	738,120
Highways, streets and bridges	78,815	215,687	65,700
Cultural and recreation	89,515	112,308	90,520
Planning commission	16,761	18,551	13,604
Capital outlay	24,565	42,502	1,850
Other	18,587	14,091	9,080
Total expenditures	1,268,835	1,631,096	1,455,823
<b>Fund Balances<sup>(a)</sup></b>	<b>421,266</b>	<b>420,940</b>	<b>549,777</b>

Notes: (a) Includes interfund transfers to and from funds other than general and special revenue funds; thus, fund balances will not total.

Sources: Oscoda Township, 1989, 1990, 1991.

fund collections) and taxes (42 percent of total FY 1991 collections). The principal expenditure functions of the township are public safety (51 percent of total FY 1991 expenditures) and general government (37 percent of total FY 1991 expenditures).

Assessed valuation in the township is approximately \$113.8 million. General obligation bond indebtedness was \$5.8 million at the end of FY 1991.

#### Closure Conditions

Reduced site-related personal income levels, lower employment, and out-migration of approximately 6,802 residents from 1990 levels are projected to result in reductions in general and special revenue fund revenues of

**\$493,630. Lower state-shared revenue and grants (\$351,663) account for about 71 percent of the lost revenues.**

**Losses in revenue would be partially offset by a reduction in expenditures of about \$254,928. The net fiscal effect of closure is revenue shortfalls of \$238,702 annually (see Table 3.6-2).**

**Increases in local tax revenue schedules and/or lower service levels may be required to maintain a balanced fiscal position at closure.**

### **3.6.3 Township of Au Sable**

#### **Recent Trends**

**Services provided by Au Sable Township are funded principally through the township's general and special revenue funds. In FY 1991, revenues and expenditures of these funds were \$488,660 and \$500,513, respectively. Fund balances were \$159,293, or about 32 percent of operating expenditures (Table 3.6-4). This was lower than FY 1989, when fund balances were \$168,658, or about 37 percent of operating expenditures.**

**The principal revenue sources of the township are taxes (57 percent of total FY 1991 general and special revenue fund collections) and state shared revenue and grants (35 percent of total FY 1991 collections). The principal expenditure functions of the township are general government (35 percent of total FY 1991 expenditures) and public safety (32 percent of total FY 1991 expenditures).**

**Assessed valuation in the township is approximately \$44.3 million. General obligation bond indebtedness was \$532,000 at the end of FY 1991.**

#### **Closure Conditions**

**Reduced site-related personal income levels, lower employment, and out-migration of approximately 733 residents from 1990 levels are projected to result in reductions in general and special revenue fund revenues of approximately \$64,935. Lower state-shared revenue and grants (\$48,550) account for about 75 percent of the lost revenues.**

**Losses in revenue would be partially offset by a reduction in expenditures of about \$34,728. The net fiscal effect of closure is revenue shortfalls of \$30,207 annually (see Table 3.6-2).**

**Increases in local tax revenue schedules and/or lower service levels may be required to maintain a balanced fiscal position at closure.**

**Table 3.6-4. Au Sable Township Revenues, Expenditures, and Fund Balances, General and Special Revenue Funds, FY 1989-1991 (current dollars)**

	1989	1990	1991
<b>Revenues</b>			
Property taxes	170,473	275,922	280,637
Licenses and permits	2,037	1,512	1,067
State shared revenue and federal grants	128,485	136,282	168,747
Charges for services	2,507	18,672	19,893
Interest earned and rents	17,159	15,752	16,136
Other	14,373	4,919	2,180
<b>Total revenues</b>	<b>335,034</b>	<b>453,059</b>	<b>488,660</b>
<b>Expenditures</b>			
General government	234,165	187,637	177,069
Public safety	153,134	160,519	158,414
Public works	26,808	55,662	66,797
Cultural and recreation	13,880	17,356	77,009
Zoning and planning commission	9,540	12,897	15,580
Other	16,472	16,500	5,644
<b>Total expenditures</b>	<b>453,999</b>	<b>450,571</b>	<b>500,513</b>
<b>Fund Balances<sup>(a)</sup></b>	<b>168,658</b>	<b>171,146</b>	<b>159,293</b>

Note: (a) Includes interfund transfers to and from funds other than general and special revenue funds; thus, fund balances will not total.

Sources: Au Sable Township, 1989, 1990, 1991.

### 3.6.4 County of Alcona

#### Recent Trends

Services provided by Alcona county are funded principally through general and special revenue funds. In FY 1991, revenues and expenditures of these funds were \$6,173,615 and \$6,036,046, respectively. Fund balances were \$1,390,337 or about 23 percent of operating expenditures (Table 3.6-5). This was an increase over FY 1989, when fund balances were \$1,058,712, or about 36 percent of operating expenditures.

The principal revenue sources of the county are state grants (44 percent of total FY 1991 general and special revenue fund collections) and taxes and penalties (24 percent of total FY 1991 collections). The principal expenditure functions of the county are public works (49 percent of total FY 1991 expenditures), public safety (16 percent of total FY 1991

**Table 3.6-5. Alcona County Revenues, Expenditures, and Fund Balances, General and Special Revenue Funds, FY 1989-1991 (current dollars)**

	1989	1990	1991
<b>Revenues</b>			
Taxes and penalties	1,319,298	1,380,579	1,451,458
Licenses and permits	2,587	3,236	3,489
Federal grants	132,021	127,547	412,015
State grants	313,512	1,725,576	2,714,174
Contributions from local units	5,400	314,051	180,637
Charges for services	537,299	833,461	947,113
Fines and forfeits	34,635	31,868	47,247
Interest and rentals	209,833	188,941	272,846
Other sources	381,402	504,981	144,636
Total revenues	2,935,987	5,110,240	6,173,615
<b>Expenditures</b>			
Legislative	74,661	84,300	76,348
Judicial	271,062	267,419	300,623
General government	602,787	595,993	610,276
Public safety	870,142	976,255	986,910
Health and welfare	659,752	714,322	747,212
Recreation and culture	110,796	102,289	109,231
Public works	99,408	1,977,947	2,970,268
Other	89,240	117,437	119,157
Capital outlay	126,443	534,468	116,021
Total expenditures	2,904,291	5,370,430	6,036,046
<b>Fund Balances<sup>(a)</sup></b>	<b>1,058,712</b>	<b>1,348,930</b>	<b>1,390,337</b>

Note: (a) Includes interfund transfers to and from funds other than general and special revenue funds, thus, fund balances will not total.

Sources: Alcona County, 1989, 1990, 1991.

expenditures), and health and welfare (12 percent of total FY 1991 expenditures).

Assessed valuation in the county is approximately \$306.1 million. General obligation bond indebtedness was \$1.2 million at the end of FY 1991.

### Closure Conditions

Reduced site-related personal income levels, lower employment, and out-migration of approximately 778 residents from 1990 levels are projected to result in reductions in general and special revenue fund revenues of \$117,738. Lower charges for services (\$38,806) and state grants (\$22,508) account for about 52 percent of the lost revenues.

Losses in revenue would be partially offset by a reduction in expenditures of \$72,951. The net fiscal effect of closure is revenue shortfalls of \$44,787 annually (Table 3.6-2).

Increases in local tax and non-tax revenue schedules and/or lower service levels may be required to maintain a balanced fiscal position at closure.

### **3.6.5 Township of Greenbush**

#### Recent Trends

Services provided by Greenbush are funded principally through general and special revenue funds. In FY 1991, revenues and expenditures of these funds were \$126,929 and \$154,201, respectively. Fund balances were \$85,542, or about 55 percent of operating expenditures (Table 3.6-6). This was lower than FY 1989, when fund balances were \$90,813, or about 81 percent of operating expenditures.

The principal revenue sources of the township are federal and state revenues (51 percent of total FY 1991 general and special revenue fund collections) and taxes (21 percent of total FY 1991 collections). The principal expenditure functions of the township are for public works, planning, zoning (49 percent of total FY 1991 expenditures), and general government (20 percent of total FY 1991 expenditures).

Assessed valuation in the township is approximately \$39 million. Greenbush had no general obligation bond indebtedness at the end of FY 1991.

#### Closure Conditions

Reduced site-related personal income levels, lower employment, and out-migration of approximately 304 residents from 1990 levels are projected to result in reductions in general and special revenue fund revenues of \$17,732. Lower federal and state revenues (\$12,314) account for about 69 percent of the lost revenues.

**Table 3.6-6. Greenbush Township Revenue, Expenditures, and Fund Balances, General and Special Revenue Funds, FY 1989 and FY 1991  
(current dollars)**

	1989	1991
<b>Revenues</b>		
Taxes	29,066	26,251
Licenses and permits	1,240	2,205
Federal and state revenues	54,586	64,606
Charge for services	12,162	11,563
Interest and rentals	6,127	11,032
Other	878	11,272
Total revenues	104,059	126,929
<b>Expenditures</b>		
General government	34,465	31,158
Township hall	5,684	6,934
Public safety	17,782	17,919
Public works, planning and zoning	42,424	75,497
Recreation and other	11,385	22,693
Total expenditures	111,740	154,201
<b>Fund Balances</b>	90,813	85,542

**Notes:** Audit reports are prepared biennially for Greenbush Township. Audited data for 1990 are not available. Fund balances include interfund transfers to and from funds other than general and special revenue funds; thus, fund balances will not total.

**Sources:** Greenbush, 1989, 1991.

Losses in revenue would be partially offset by a reduction in expenditures of \$8,677. The net fiscal effect of closure is revenue shortfalls of \$9,055 annually (Table 3.6-2).

Increases in local tax revenue schedules and/or lower service levels may be required to maintain a balanced fiscal position at closure.

### **3.6.6 Oscoda Area Schools**

#### **Recent Trends**

Services provided by Oscoda Area Schools are funded principally through the district's general and special revenue funds. In FY 1991, revenues and expenditures of these funds were \$13,888,363 and \$13,975,868, respectively. Fund balances were \$2,664,524 or about 19 percent of operating expenditures for this year (Table 3.6-7). This is lower than FY 1989, when fund balances were \$3,038,345, or about 25 percent of operating expenditures.

**Table 3.6-7. Oscoda Area Schools District General and Special Revenue Fund Revenues and Expenditures, FY 1989-1991 (current dollars)**

	1989	1990	1991
<b>Revenues</b>			
Local sources	6,373,969	6,699,647	7,087,281
State sources	2,440,340	2,761,667	3,848,306
Federal sources	2,426,620	3,061,570	2,952,776
Total Revenues	11,240,929	12,522,884	13,888,363
<b>Expenditures</b>			
Instruction	7,171,325	7,783,028	8,193,122
Support services	4,394,312	4,520,643	4,621,756
Other services	681,392	742,605	732,288
Capital outlay	66,697	1,120	428,702
Total expenditures	12,313,726	13,047,396	13,975,868
<b>Fund Balances<sup>(a)</sup></b>	<b>3,038,345</b>	<b>2,513,833</b>	<b>2,664,524</b>

Note: (a) Includes interfund transfers to and from funds other than general and special revenue funds; thus, fund balances will not total.

Sources: Weinlander, et. al., 1990, 1991.

Funding from local sources (51 percent of FY 1991 general and special revenue fund collections) amounted to \$7,087,281, of which about \$6.3 million was from property tax revenue. At \$3,848,306, state sources contributed about 28 percent of revenues collected in FY 1991. The principal expenditure by the district was for instruction (\$8,193,122, or about 59 percent of total FY 1991 expenditures). Support services (\$4,621,756) comprised about 33 percent of expenditures in FY 1991.

#### Closure Conditions

Reduced migratory-related enrollment of 1,712 students will result in reduced general and special revenue fund revenues of \$7,135,730. Reductions in state aid (\$1,362,388) and Federal Impact Aid, P.L. 81-874, revenues (\$2,215,000) would be the principal revenue sources affected.

These losses could be partially offset by reductions in expenditures of \$4,947,934. The net fiscal effect of closure is revenue shortfalls of \$2,187,796 annually. Further reductions in service levels and/or increases from other revenue sources may be required to maintain a balanced fiscal position.



### 3.6.7 Tawas Area Schools

#### Recent Trends

Services provided by Tawas Area Schools are funded principally through the district's general and special revenue funds. In FY 1991, revenues and expenditures of these funds were \$5,896,248 and \$6,314,860, respectively. Fund balances were \$314,802, or 5 percent of operating expenditures for 1991 (Table 3.6-8). This is lower than FY 1989, when fund balances were \$378,536, or 7 percent of operating expenditures.

**Table 3.6-8. Tawas Area School District General and Special Revenue Fund Revenues and Expenditures, FY 1989-1991 (current dollars)**

	1989	1990	1991
<b>Revenues</b>			
Local sources	4,882,427	5,336,719	5,495,226
State sources	140,346	166,515	123,879
Federal sources	221,467	263,943	277,143
Total revenues	5,244,240	5,767,177	5,896,248
<b>Expenditures</b>			
Instruction	3,415,953	3,632,421	3,959,987
Support services	1,615,365	1,744,784	1,975,720
Other services	399,590	360,126	379,153
Total expenditures	5,430,908	5,737,331	6,314,860
<b>Fund Balances<sup>(a)</sup></b>	<b>378,536</b>	<b>547,922</b>	<b>314,802</b>

Note: (a) Includes interfund transfers to and from funds other than general and special revenue funds: thus, fund balances will not total.

Sources: Weinlander, et. al., 1990, 1991.

Funding from local sources (93 percent of FY 1991 general and special revenue fund collections) amounted to \$5,495,226, of which about \$5 million was from property tax revenue. The principal expenditure for the district was for instruction (\$3,959,987, or about 63 percent of total FY 1991 expenditures). Support services (\$1,975,720) comprised about 31 percent of expenditures in FY 1991.

#### Closure Conditions

Reduced migratory-related enrollment of 55 pupils will result in reduced general and special revenue fund revenues of \$178,780 principally from lower local revenue source.

These losses could be partially offset by reductions in expenditures of \$145,713. The net fiscal effect of closure is revenue shortfalls of \$33,067 annually.

## **3.7 TRANSPORTATION**

### **3.7.1 Roadways**

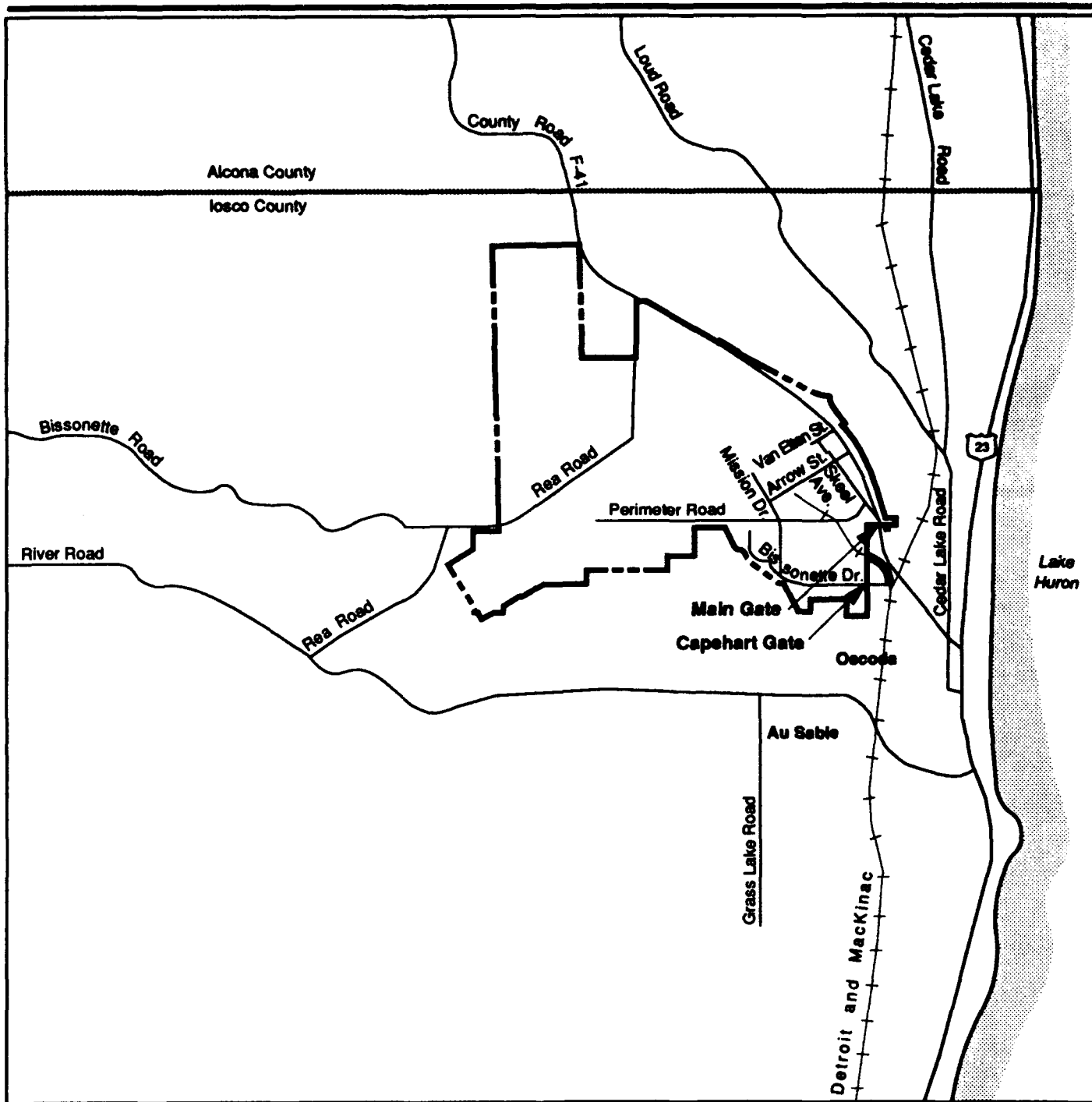
This section addresses preclosure and closure conditions of roadways, air transportation, and other modes of transportation. The ROI includes the townships of Oscoda and Au Sable. A more detailed discussion of transportation is presented in Section 3.2.3 of the *EIS for Disposal and Reuse of Wurtsmith AFB*.

#### **Recent Trends**

Regional access to Wurtsmith AFB is provided by U.S. 23, a principal north-south roadway through Iosco, Arenac, and Alcona counties; Michigan Route 55, a major east-west roadway, connecting U.S. 23 at Tawas City with Interstate 75; and Michigan Route 65, a north-south roadway parallel to U.S. 23, located about 20 miles to the west (Figure 3.7-1).

For the purposes of this analysis, the following local roads have been identified as the most important in providing access to the base area:


- County Road F-41 between U.S. 23 and the Main Gate to Wurtsmith AFB provides the main access to the base via the Main Gate. It is a four-lane roadway with three signalized intersections (at U.S. 23, Cedar Lake Road, and Skeel Avenue) and one at-grade rail crossing. North of the Main Gate, F-41 is a two-lane roadway.
- Cedar Lake Road is a two-lane roadway connecting County Road F-41 to a residential area in north Oscoda.
- Loud Road is a two-lane residential roadway from Cedar Lake Road that provides access to the eastern shore of Van Etten Lake.
- River Road between U.S. 23 and Grass Lake Road is a two-lane, east-west urban street in the southern part of Oscoda. Farther west, River Road is a two-lane rural roadway.
- Rea Road is a two-lane rural roadway connecting F-41 to River Road on the west side of the base.
- Bissonette Road is a two-lane rural roadway connecting Rea Road to west Iosco County.



#### EXPLANATION

----- Base Boundary

+ + + Railroad

 U. S. Highway

#### Local Transportation System

  
0 1750 3500 7000 Feet



Figure 3.7-1

Wurtsmith AFB is accessible through two gates (Figure 3.7-1). The Main Gate, at Skeel Avenue, is used by civilian and military personnel, visitors, contractors, and for industrial and commercial deliveries. All incoming vehicles associated with base activity, other than housing, travel on Skeel Avenue from the Main Gate, with most traffic dividing at the Arrow Street intersection. The Capehart Gate, on Bissonette Drive, is the primary access to on-base family housing.

On-base roads are primarily two-way, two-lane, paved roads, with no street parking, and a speed limit of 25 miles per hour. Traffic control is achieved by yield and stop signs with priority given to major streets. The on-base roads with the heaviest traffic are Skeel Avenue, Arrow Street, and a segment of Perimeter Road off of Skeel Avenue.

Preclosure (1990) and closure (1993) conditions on key roads in the vicinity are summarized in Table 3.7-1. The table shows hourly capacity, traffic volumes, and the corresponding level of service (LOS) during peak hours of the peak month (July) for key roads.

**Table 3.7-1. July Peak-Hour Traffic Volumes on Key Roads**

Road	Capacity	Preclosure (1990)		Closure (1993)	
		Traffic	LOS	Traffic	LOS
U.S. 23 (at F-41 junction)	3,300	4,500	F	2,600	E
County Road F-41 (Cedar Lake Road to Skeel Avenue)	5,500	2,100	B	400	A
Country Road F-41 (Skeel Avenue to Rea Road)	2,500	500	B	300	A
Cedar Lake Road	2,500	850	C	250	A
Loud Road	2,500	250	A	100	A
River Road	2,500	650	C	200	A
Rea Road	2,500	150	A	150	A
Bissonette Road	2,500	150	A	150	A

The most critical preclosure traffic conditions are concentrated along the urban section of U.S. 23 extending through Au Sable and Oscoda. U.S. 23 operates at LOS F at the junction with County Road F-41 in Oscoda, at LOS D at the north Iosco County line, and at LOS E along most other segments. The preclosure LOS along County Road F-41 is B or better. Cedar Lake Road in the vicinity of the F-41 intersection and River Road at the rail crossing both operate at LOS C. All other local roads operate at LOS A.

On-base roads operate at LOS B or better throughout the year, except Skeel Avenue, which operates at LOS C during the peak hour.

#### Closure Baseline

Upon closure of Wurtsmith AFB, traffic in the vicinity of the base will decrease. The LOS along U.S. 23 through Oscoda and Au Sable will improve from level E to D; at the F-41 junction, the LOS will improve from F to E. All other local road segments will operate at LOS A throughout the year, compared to LOS C or better in 1990. Traffic on base will be limited to the movement of the OL team, which, when compared to preclosure conditions, will be minimal. All on-base roads will operate at LOS A.

#### **3.7.2 Air Transportation**

Air transportation includes passenger travel by commercial airline and charter flights, business and recreational travel by private aircraft (general aviation), and priority package and freight delivery by commercial carriers.

#### Recent Trends

The Wurtsmith AFB ROI contains no airports that support commercial passenger service. The nearest airport with significant passenger service is Tri-City International, near Saginaw, approximately 90 miles south of Oscoda, which is well beyond the airspace ROI for Wurtsmith AFB. Iosco County travelers use Tri-City for commercial passenger service. Scheduled passenger service is also offered at Alpena Regional Airport, 45 miles north of the base.

Two public-use general aviation airports are within the ROI: Harrisville City Airport, 13 miles north of the base, and Iosco County Airport, 10 miles south of the base. There are also six restricted/private-use airports within the ROI. Iosco County had scheduled passenger service in 1988, but the service was discontinued in 1989 due to low passenger levels. There is a limited level of general aviation passenger and cargo demand at Iosco County Airport. Annual levels of passenger and cargo are not definable for such a small operation, because many of the occurrences are not scheduled or recorded.

#### Closure Conditions

The Iosco County Airport would remain open. There would be a negligible reduction in air passenger traffic through Tri-City and Alpena airports due to the relocation of base personnel and dependents who currently use these airports.

### **3.7.3 Other Transportation Modes**

#### **Recent Trends**

There is no rail passenger service in the area. The closest intercity rail route (AMTRAK) is the Kalamazoo-Lansing-Flint-Port Huron-Toronto line, 140 miles south of the base. Rail freight service to northeastern Michigan is provided by the Detroit and Mackinac rail system, headquartered in Tawas City. Two trains per day pass through Tawas City. Early in 1992, the railroad was sold to Lake State Railway Company. Since the 1950s, rail freight has been declining and losing markets to trucks. In the ROI, there is one-way track with at-grade crossings and many sharp curves, which appreciably reduce the average speed. Rail freight service to Wurtsmith AFB, primarily carrying JP-4 fuel, is provided by an on-base spur.

Wurtsmith AFB is 2 miles from Lake Huron. Major ports on the lake are at Alpena to the north and Bay City to the south. Within Iosco County, there are two docks just south of Tawas City where gypsum from the local quarry is loaded.

#### **Closure Conditions**

Upon closure there will be no jet fuel hauled to the base; however, no major change in local or regional rail service is expected to occur.

## **3.8 UTILITIES**

This section summarizes preclosure and closure conditions of utilities on Wurtsmith AFB and in the ROI. The ROI for each utility consists of the service areas of that utility provider serving Wurtsmith AFB, Oscoda and Au Sable townships, and other portions of Iosco County. Utility demand forecasts in the ROI are shown in Table 3.8-1 for the period 1990 to closure. A more detailed presentation of these conditions is available in the *EIS for Disposal and Reuse of Wurtsmith AFB*.

### **3.8.1 Water Supply**

#### **Recent Trends**

Wurtsmith AFB derives its water for domestic use from on-base wells. The water is pumped from a shallow aquifer, which extends to a depth of about 65 feet and is composed of sand and gravel deposits. Underlying the aquifer are silty clays and, at a depth of 200 to 250 feet, bedrock. The total pumping capacity of the seven active wells is 2.2 million gallons per day (MGD). The water supply is limited by the total capacity of the pumping system and areas of groundwater contamination. The water at each well is chlorinated, fluoridated, and pumped directly into the water

**Table 3.8-1. Estimated Preclosure and Baseline Utility Demand in the ROI, 1990 to Closure**

Utility	1990	1991	1992	Closure
<b>Water Consumption (MGD)</b>				
Preclosure Forecast	2.23	2.27	2.29	2.31
Closure Baseline	2.23	2.23	2.04	1.51
<b>Wastewater Treatment (MGD)</b>				
Preclosure Forecast	1.82	1.97	1.98	2.00
Closure Baseline	1.82	1.79	1.67	1.22
<b>Solid Waste Disposal (tons/day)</b>				
Preclosure Forecast	45.1	45.4	45.8	46.2
Closure Baseline	45.1	44.9	37.7	21.6
<b>Electricity Consumption (MWH/day)</b>				
Preclosure Forecast	227	234	235	236
Closure Baseline	227	231	202	92
<b>Natural Gas Consumption (thousand therms/day)</b>				
Preclosure Forecast	31.9	31.7	31.9	32.1
Closure Baseline	31.9	31.7	28.5	19.0

Notes: MGD = million gallons per day

MWH = megawatt-hours

Figures for closure (1993) are estimated based on a trend (1 percent growth per year) and account for personnel drawdown schedule at base.

Sources: Ayres Associates, 1990; Hager, 1992; Kenyon, 1992; King, 1992; Smith, 1992; U.S. Air Force, 1992b; Wade-Trim/Edmands, 1992; Wastewater Operation Services, 1990a, 1990b, 1991a, 1991b, 1992a, 1992b.

distribution system. In 1990, Wurtsmith AFB used an average of 0.62 MGD. The Michigan Department of Public Health indicated that the base wells would continue to be used after base closure, provided that extensive testing was conducted to monitor contaminant levels (Wade-Trim/Edmands, 1992).

Domestic water storage capacity at the base is 800,000 gallons consisting of two 300,000-gallon elevated tanks and one 200,000-gallon tank at ground level. In addition, a 100,000-gallon ground-level tank with backflow protection adjacent to the WSA feeds a separate fire protection hydrant system.

Water providers outside Wurtsmith AFB are Oscoda Township and the Tawas Utility Authority. The Oscoda Township water system serves the communities of Oscoda and Au Sable from nine wells with a pumping capacity of 1.9 MGD. The water from these wells is chlorinated, purified, and pumped directly into the distribution system. In 1990, Oscoda and Au Sable used an average of 0.8 MGD.

The East Tawas water system draws its water from Lake Huron and serves Tawas City, the city of East Tawas, and part of Baldwin Township. East Tawas is constructing a new water treatment plant at Tawas Point which will replace the plant. Tawas Utility Authority has a treatment capacity of 1.7 MGD and sold an average of 0.77 MGD to customers.

#### Closure Conditions

Upon base closure, the total water consumption in the ROI would be reduced by 0.72 MGD below the 1990 average demand level of 2.23 MGD (Table 3.8-1), a 32-percent reduction.

### **3.8.2 Wastewater**

#### Recent Trends

Domestic sewage at Wurtsmith AFB is discharged to the base sanitary sewer system at an average daily flow of approximately 0.475 MGD. The treatment system is designed for flows of 1.0 MGD average, 0.5 MGD minimum, and 3.0 MGD peak. The base sanitary sewage treatment system, last modified in 1982, consists of three aerated ponds with impermeable membrane liners. Sewage influent is first collected and screened at a facility south of the cantonment area (originally a treatment plant), and then pumped to the aerated ponds 2.5 miles away. Under average flow conditions, the sewage is retained in the ponds for 30 days prior to release into seepage beds. From the seepage beds, the effluent is discharged to the groundwater and ultimately drains into the Au Sable River.

The ROI for wastewater collection, treatment, and disposal consists of the communities of Oscoda and Au Sable and, to some extent, East Tawas and Tawas City. In 1990, the ROI, including Wurtsmith AFB, produced an average of 1.82 MGD of sanitary wastewater. The combined design flows of the base, Oscoda, and Tawas WWTPs is 4.2 MGD.

Williams and Works Operation Services, a private company, currently operates the two WWTPs in the ROI, located in Oscoda and Tawas. At both plants, the wastewater is treated using the extended aeration mode of the activated sludge process. Clarified secondary effluent is disinfected with chlorine and dechlorinated with sulfur dioxide prior to discharge in the Au Sable River. In 1990, the Oscoda system treated 83 million gallons of sewage, which represents 0.23 MGD. The Oscoda WWTP design flow is 0.8 MGD, and the design peak flow is 1.4 MGD. The Tawas WWTP treats an average of 1.08 MGD; the design flow is 2.4 MGD.



### Closure Conditions

At closure, the average daily flow from OL activities would be 0.01 MGD. Wastewater flows in the Oscoda system would be reduced further as base-related population leaves the area. The Tawas system would be only minimally affected.

### **3.8.3 Solid Waste**

#### Recent Trends

Solid waste generated on base and in the ROI is hauled by an independent contractor to the Tawas transfer station, then to the Pinconning Landfill, a Michigan Department of Natural Resources permitted sanitary landfill located near Pinconning. This landfill is used by 12 counties including Iosco and has an area of 104 acres with a life span of 20 more years. There are no permitted landfills in Iosco County.

The ROI generated an average of 45 tons per day of solid waste in 1990. Before closure, the base contributed approximately 36 percent of the total waste material entering the regional landfill from the ROI.

#### Closure Conditions

Upon base closure, Wurtsmith AFB will generate minimal amounts of solid waste associated with the maintenance of buildings and grounds as a result of the OL activities. The amount of solid waste generated off base will decrease in proportion to population out-migration.

The amount of waste material created in the ROI in 1993 is estimated at an average of 22 tons per day, approximately 49 percent of the 1990 amount (Table 3.8-1).

### **3.8.4 Energy**

#### **Electricity**

#### Recent Trends

Wurtsmith AFB purchases its electric power from CPCO. At the main substation, the power is allocated to two distribution systems: two 2,500-kilovolt-ampere (kVA) transformers supply power to central base facilities and one 5,000-kVA transformer supplies power to family housing. The three transformers are CPCO owned. The primary distribution system is an ungrounded delta system that delivers 12-kilovolt (kV) power through primarily overhead and some underground lines. The distribution system is operating near capacity. In 1990, the average daily usage of electrical

power was 121 megawatt-hours (MWH). Records show little seasonal variation; though, in winter, usage is slightly higher.

Electric energy is supplied to the ROI by CPCO through a 46-kV transmission line from Bay City, Weadock, and Karn steam plants, via Tawas to Alpena (parallel to U.S. 23). In the ROI, the estimated daily consumption of electricity in 1990 was 227 MWH.

The ROI, with fewer than 20,000 customers, accounts for less than 1 percent of CPCO customers (King, 1992).

#### Closure Conditions

Upon closure, the electrical demands for Wurtsmith AFB will decrease to a minimal level. In the ROI, the daily consumption would decrease to 92 MWH per day; this represents approximately a 59 percent decrease from 1990.

#### **Natural Gas**

#### Recent Trends

Natural gas is supplied to the ROI by MichCon by a pipeline that runs from Big Rapids to Alpena via Tawas City. Off-base use of natural gas is primarily for heating.

Natural gas has been used on base for water heating and cooking purposes and as the primary fuel for the central heating plant on base.

The on-base distribution system is in good condition. In 1990, the base used an average of 11,970 therms per day and the ROI used approximately 31,900 therms per day (Table 3.8-1). The ROI accounts for less than 1 percent of MichCon customers.

#### Closure Conditions

Based on population changes in the area, natural gas demand within the ROI with the base closure was estimated at 19,000 therms per day (Table 3.8-1), a decrease in natural gas demand in the ROI of approximately 40 percent from 1990.

## **On-Base High-Temperature Hot Water Heating System**

### **Recent Trends**

The majority of the Wurtsmith AFB cantonment area, including the hospital, dormitories, and several buildings, is served by a central heating plant consisting of four high-temperature hot water generators with an average of 56 million British thermal units (MBTU) per hour demand and a capacity of 81 MBTU per hour. The generators were converted from No. 2 fuel oil to natural gas in 1987; No. 2 fuel oil is still used as backup. The plant provides heating as well as hot water for domestic use. The base utilizes underground mains, consisting of two pipes (supply and return), providing high-temperature hot water at 400°F at 250 pounds per square inch. The total energy produced in the highest month of 1990 (February) was about 34,000 MBTU; during the summer, energy production was reduced to about 5,000 MBTU.

### **Closure Conditions**

Upon base closure, the maintenance cost of the high-temperature hot water heating system would make its continued operation uneconomical for the size of the OL.

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## **4.0 SOCIOECONOMIC EFFECTS OF PROPOSED ACTION AND ALTERNATIVES**

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### **4.1 INTRODUCTION**

This chapter discusses the potential socioeconomic effects associated with the Proposed Action and two alternatives for reuse of Wurtsmith AFB, as well as the No-Action Alternative. The purpose of this study is to identify and analyze the major socioeconomic issues related to each of the four possibilities for future activity at the base and compare the effects of these alternatives with each other.

To help identify potential socioeconomic effects of reuse of Wurtsmith AFB, this study addresses a range of reasonable reuse alternatives. For the purpose of this analysis, the Air Force has adopted the redevelopment plans developed by the WAEAC as the Proposed Action. In addition, the Air Force has also analyzed the effects associated with other reasonable reuse alternatives. These include the Fire Training Alternative, the Recreation Alternative, and a No-Action Alternative without reuse. Actual decisions on reuse of the property will be made by its recipients subsequent to conveyance.

Descriptions of the effects of the Proposed Action and alternatives are provided sequentially for each of seven major issue areas: economic activity, population, housing, public services, public finance, transportation, and utilities. The *EIS for Disposal and Reuse of Wurtsmith AFB, Michigan*, provides more detailed descriptions of effects for Transportation and Utilities. The description of effects of the No-Action Alternative is the same as the closure conditions described in Chapter 3.

**Context of Analysis.** This analysis addresses the timing of effects associated with each of the various alternative plans for future reuse of the base. The analysis covers a time period extending 20 years beyond the date of closure (June 30, 1993) of Wurtsmith AFB, and the results are presented for the Proposed Action and alternatives for the years 1998 (5 years after closure), 2003 (10 years after closure), and 2013 (20 years after closure).

Of particular importance in this analysis are site-related and migratory effects. Site-related effects include all activities associated with the base area. These would include all direct and secondary employment and their resultant effects on population as a result of either reuse-related activities or activities associated with the OL.

Migratory effects are defined to be all of the effects associated with persons who move into the ROI solely as a result of reuse-related activities. The migratory-related effects are a component of the site-related effects. In addition to these migratory effects, the site-related effects include the reuse activities or caretaker activities that are filled by the resources existing within the ROI. For example, the Proposed Action would generate a particular number of jobs, some of which would be filled by the local available labor pool and others which would be filled by persons moving into the ROI for the purpose of gaining employment related to the reuse activities.

Site-related jobs over the No-Action Alternative are forecast to reach 6,867 in 2013 with the Proposed Action, 3,689 with the Fire Training Alternative, and 2,185 with the Recreation Alternative. The number of in-migrating workers in 2013 is expected to be 2,421 with the Proposed Action, 1,382 with the Fire Training Alternative, and 830 with the Recreation Alternative.

Site-related population at 2013 is projected to be 24,068 persons with the Proposed Action, 13,022 persons with the Fire Training Alternative, and 7,802 persons with the Recreation Alternative. In 2013, the in-migrating population is projected to reach 8,352 with the Proposed Action, 4,749 with the Fire Training Alternative, and 2,835 with the Recreation Alternative.

Many socioeconomic effects are caused primarily by population in-migration. These effects include changes in housing demand, public service requirements, local government expenditures and revenues, traffic volumes, and utility consumption. This analysis addresses the implications of population in-migration for each of these key related indicators.

This analysis recognizes the potential for community reactions stemming from "announcement effects" of information regarding the base's closure or reuse. Such announcements may affect the community's perceptions and, thus, could have important local economic consequences. An example of an announcement effect would be the in-migration of people anticipating employment under one of the reuse options. If it were announced later that the No-Action Alternative was chosen, many of these newcomers would leave the area seeking employment elsewhere. This announcement effect would thus include (a) a temporary increase in population in anticipation of future employment, and (b) a subsequent decline in population as people leave the area after the announcement. Bases with more than one closure announcement may not experience as severe an announcement effect.

Changes associated with announcement effects, while potentially important, are highly unpredictable and difficult to quantify. Such effects therefore were excluded from the quantitative analysis in this study, and are not displayed in any of the tabular or graphic data presented in this report.

The methods used to evaluate the effects of reuse of the site are consistent with those used to assess the effects of closure. These methods are described in Appendix B.

## **4.2 ECONOMIC ACTIVITY**

Under the post-closure scenario, Wurtsmith AFB would not be reused and OL activities at the site would contribute little economic stimulus to the ROI. In this situation, employment in the ROI is projected to increase from 33,495 at closure to 35,604 by the year 2013, which represents an annual average growth rate of 0.3 percent (extrapolated from projections by the Michigan Department of Management and Budget, 1985).

For each of the reuse alternatives (Proposed Action, Fire Training Alternative, and Recreation Alternative), economic activity is expressed as the number of direct and secondary jobs and earnings over those projected for the No-Action Alternative (caretaker status).

Of the reuse alternatives evaluated for this study, the Proposed Action would generate the greatest economic effects.

### **4.2.1 Proposed Action**

**Direct Jobs.** Employment associated with the Proposed Action would begin immediately upon its implementation. The number of direct jobs would increase to 2,938 in 1998, 3,461 in 2003, and 4,285 in 2013 (Table 4.2-1). Nearly all of these direct jobs would be associated with operations activities on the site, with less than 2 percent of direct jobs attributable to construction by 1998 and less than 0.5 percent by 2013. The on-site activities creating the largest number of jobs would be aviation support, commercial office use, and industrial development.

**Secondary and Total Jobs.** The Proposed Action would create additional off-site secondary jobs in the ROI through the multiplier effects of worker spending and purchases of goods and services by new companies on the site. Secondary jobs are projected to number 1,843 in 1998, 2,146 in 2003, and 2,582 in 2013. This secondary employment brings total ROI jobs created by the Proposed Action to 4,781 in 1998, 5,607 in 2003, and 6,867 in 2013 (see Table 4.2-1).

**Earnings.** Total annual earnings generated by the Proposed Action are projected to be \$114,231,000 in 1998, \$133,297,000 in 2003, and \$160,761,000 in 2013 (see Table 4.2-1). Most of these earnings would be attributable to direct operations jobs, with earnings from this source estimated at \$79,921,000 in 1998, \$94,436,000 in 2003, and \$114,002,000 in 2013. Secondary earnings are estimated at \$46,252,000 by 2013.

**Table 4.2-1. ROI Employment and Earnings Projections - Proposed Action**

	1998	2003	2013
<b>Site-Related Employment and Earnings</b>			
<b>Reuse Effects</b>			
Employment			
Direct	2,988	3,511	4,335
Construction	58	19	19
Operation	2,930	3,492	4,316
Secondary	1,854	2,157	2,593
Total	4,842	5,668	6,928
Earnings (\$000) <sup>(a)</sup>			
Direct	82,437	95,961	115,527
Construction	1,498	507	507
Operation	80,939	95,454	115,020
Secondary	32,993	38,535	46,433
Total	115,430	134,496	161,960
<b>No-Action Effects<sup>(b)</sup></b>			
Employment	61	61	61
Earnings (\$000) <sup>(a)</sup>	1,199	1,199	1,199
<b>Reuse Increase over No-Action Effects</b>			
Employment			
Direct	2,938	3,461	4,285
Construction	58	19	19
Operations	2,880	3,442	4,266
Secondary	1,843	2,146	2,582
Total	4,781	5,607	6,867
Earnings (\$000) <sup>(a)</sup>			
Direct	81,419	94,943	114,509
Construction	1,498	507	507
Operations	79,921	94,436	114,002
Secondary	32,812	38,354	46,252
Total	114,231	133,297	160,761
<b>ROI Employment</b>			
With No-Action Alternative	34,151	34,734	35,604
With Proposed Action	38,932	40,341	42,471
<b>In-Migrating Workers<sup>(c)</sup></b>			
Direct	1,477	1,750	2,162
Construction	12	4	4
Operation	1,465	1,746	2,158
Secondary	185	216	259
Total	1,662	1,966	2,421

Notes: (a) Constant 1989 dollars.

(b) No-Action Alternative is the closure baseline projection, extended beyond closure, with the OL in place and the base in caretaker status. Effects include both direct and secondary employment and earnings.

(c) In-migrating workers are holders of site-related jobs and are expected to live in the ROI with reuse but would not live in the ROI without reuse. Refer to Appendix B, Methods, for migratory employment assumptions.



**ROI Jobs with the Proposed Action.** The total number of jobs in the ROI would increase from 33,495 at closure to 38,932 in 1998, 40,341 in 2003, and 42,471 in 2013 (see Table 4.2-1). The average annual rate of employment growth in the ROI during this 20-year period would be 1.2 percent with the Proposed Action, compared to 0.3 percent under 1993 closure baseline conditions. The trend in ROI employment with the Proposed Action is graphically displayed in Figure-4.2-1.

**In-Migrating Workers.** About 65 percent of the jobs created by the Proposed Action are expected to be filled by area residents living in the ROI. Without the Proposed Action, this labor pool would either be unemployed, not actively seeking jobs, working in part-time or occasional jobs, or commuting to work outside the area during portions of the year. These available workers are likely to have many of the skills needed for the jobs created by the Proposed Action, especially for secondary and construction jobs. Other jobs would be filled by workers relocating to the ROI, depending on the specific skills required and general economic conditions. Relocation is expected to start for some types of jobs at the earliest stages of reuse. The total number of in-migrating workers is expected to be 1,662 in 1998, 1,966 in 2003, and 2,421 in 2013 (Table 4.2-1).

#### **4.2.2 Fire Training Alternative**

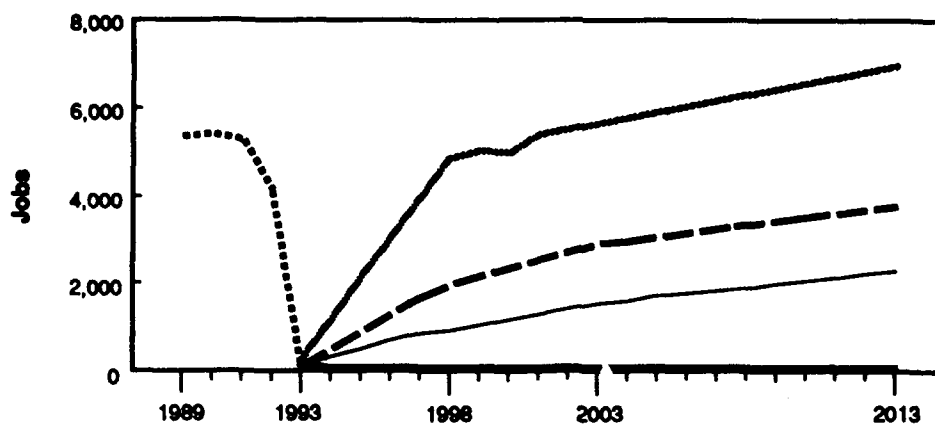
**Direct Jobs.** Employment associated with the Fire Training Alternative would begin immediately upon its implementation. The number of direct jobs would increase to 1,308 in 1998, 1,876 in 2003, and 2,498 in 2013 (Table 4.2-2). Nearly all of these direct jobs would be associated with operations activities on the site, with about 4.1 percent of direct jobs attributable to construction by 1998, declining to less than 1.6 percent by 2013. Commercial office use and industrial development activities are projected to create the largest number of jobs of any of the on-site activities.

**Secondary and Total Jobs.** Under the Fire Training Alternative, the secondary (or multiplier) effects of worker spending and purchases of goods and services by new companies on the site would create additional off-site secondary jobs in the ROI. The number of secondary jobs is projected to be 570 in 1998, 913 in 2003, and 1,191 in 2013. A combination of the direct and secondary jobs would increase the total number of jobs created by the Fire Training Alternative to 1,878 in 1998, 2,789 in 2003, and 3,689 in 2013 (Table 4.2-2).

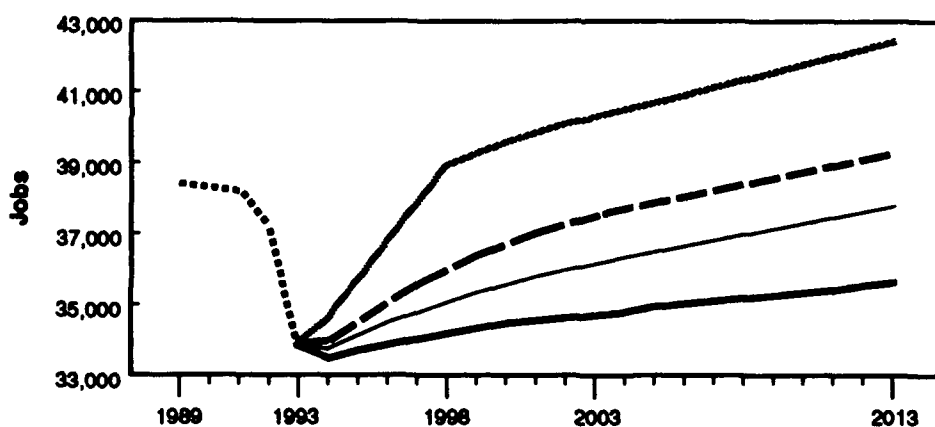
**Earnings.** Total annual earnings generated by the Fire Training Alternative are projected to be \$33,982,000 in 1998, \$54,791,000 in 2003, and \$75,817,000 in 2013 (see Table 4.2-2). Most of these earnings would be attributable to direct operations jobs, with earnings from this source estimated at \$21,541,000 in 1998, \$36,155,000 in 2003, and

ALTERNATIVE	1993 <sup>(a)</sup>	1998	2003	2013
Proposed Action	61	4,781	5,607	6,867
Fire Training	61	1,878	2,789	3,689
Recreation	61	845	1,450	2,185
No-Action	61	0	0	0

Reuse-Related  
Employment  
Effects



Reuse-Related  
Employment  
Effects<sup>(b)</sup>



Total  
Employment  
Including  
Reuse  
Effects

#### EXPLANATION

- ..... Preclosure
- Proposed Action
- Fire Training Alternative
- Recreation Alternative
- No-Action Alternative

#### Reuse-Related Employment Effects

- (a) The 1993 values represent total base-related employment under the closure baseline.  
 (b) Employment effects represent the change in employment relative to the No-Action Alternative.

Figure 4.2-1

**Table 4.2-2. ROI Employment and Earnings Projections - Fire Training Alternative**

	1998	2003	2013
<b>Site-Related Employment and Earnings</b>			
<b>Reuse Effects</b>			
Employment			
Direct	1,358	1,926	2,548
Construction	55	40	40
Operation	1,303	1,886	2,508
Secondary	581	924	1,202
Total	1,939	2,850	3,750
Earnings (\$000) <sup>(a)</sup>			
Direct	24,023	38,184	54,398
Construction	1,464	1,011	1,011
Operation	22,559	37,173	53,387
Secondary	11,158	17,806	22,618
Total	35,181	55,990	77,016
<b>No-Action Effects<sup>(b)</sup></b>			
Employment	61	61	61
Earnings (\$000) <sup>(a)</sup>	1,199	1,199	1,199
<b>Reuse Increase over No-Action Effects</b>			
Employment			
Direct	1,308	1,876	2,498
Construction	55	40	40
Operations	1,253	1,836	2,458
Secondary	570	913	1,191
Total	1,878	2,789	3,689
Earnings (\$000) <sup>(a)</sup>			
Direct	23,005	37,166	53,380
Construction	1,464	1,011	1,011
Operations	21,541	36,155	52,369
Secondary	10,977	17,625	22,437
Total	33,982	54,791	75,817
<b>ROI Employment</b>			
With No-Action Alternative	34,151	34,734	35,604
With Proposed Action	36,029	37,523	39,293
<b>In-Migrating Workers<sup>(c)</sup></b>			
Direct	663	951	1,262
Construction	11	8	8
Operation	652	943	1,254
Secondary	58	92	120
Total	721	1,043	1,382

Notes: (a) Constant 1989 dollars.

(b) No-Action Alternative is the closure baseline projection, extended beyond closure, with the OL in place and the base in caretaker status. Effects include both direct and secondary employment and earnings.

(c) In-migrating workers are holders of site-related jobs and expected to live in the ROI with reuse but would not live in the ROI without reuse. Refer to Appendix B, Methods, for migratory employment assumptions.

**\$52,369,000 in 2013. Secondary earnings would represent about \$22,437,000 by 2013.**

**ROI Jobs with the Fire Training Alternative.** The total number of jobs in the ROI would increase from 33,495 at closure to 36,029 in 1998, 37,523 in 2003, and 39,293 in 2013 (see Table 4.2-2). The average annual employment growth rate in the ROI would be 0.8 percent under the Fire Training Alternative, compared to 0.3 percent under the closure baseline. The trend in ROI employment with the Fire Training Alternative compared to the 1993 closure baseline and the other reuse alternatives is shown in Figure 4.2-1.

**In-Migrating Workers.** About 63 percent of the jobs created by the Fire Training Alternative are expected to be filled by area residents in the ROI. Depending on specific skills needed and general economic conditions, other jobs would be filled by workers relocating to the ROI. Relocation is expected to start for some types of jobs at the earliest stages of reuse. The total number of in-migrating workers is expected to reach 721 in 1998, 1,043 in 2003, and 1,382 in 2013 (see Table 4.2-2).

#### **4.2.3 Recreation Alternative**

**Direct Jobs.** Employment associated with the Recreation Alternative would begin immediately upon its implementation. The number of direct jobs would increase from 572 in 1998 to 979 in 2003 and 1,473 in 2013 (Table 4.2-3). Nearly all of these direct jobs would be associated with operations activities on the site; less than 2.8 percent would be attributable to construction in 1998, decreasing to less than 1 percent by 2013. The on-site activities creating the largest number of jobs would be commercial office use and industrial development.

**Secondary and Total Jobs.** The multiplier effects of worker spending and purchases of goods and services by new companies on the site would create additional off-site secondary jobs in the ROI. The number of secondary jobs created under the Recreation Alternative is projected to be about 273 in 1998, 471 in 2003, and 712 in 2013. These secondary jobs would increase the total number of jobs created by the Recreation Alternative to 845 in 1998, 1,450 in 2003, and 2,185 in 2013 (Table 4.2-3).

**Earnings.** Total annual earnings generated by the Recreation Alternative are projected to be \$16,685,000 in 1998, \$30,076,000 in 2003, and \$46,556,000 in 2013 (Table 4.2-3). Most of these earnings would be attributable to direct operations jobs, with earnings estimated at \$11,031,000 in 1998, \$20,872,000 in 2003, and \$33,046,000 in 2013. Secondary earnings would represent about \$13,137,000 by 2013.

**Table 4.2-3. ROI Employment and Earnings Projections - Recreation Alternative**

	1998	2003	2013
<b>Site-Related Employment and Earnings</b>			
<b>Reuse Effects</b>			
Employment			
Direct	622	1,029	1,523
Construction	17	14	14
Operation	605	1,015	1,509
Secondary	2844	482	723
Total	906	1,511	2,246
Earnings (\$000) <sup>(a)</sup>			
Direct	12,515	22,263	34,437
Construction	466	373	373
Operation	12,049	21,890	34,064
Secondary	5,369	9,012	13,318
Total	17,884	31,275	47,755
<b>No-Action Effects<sup>(b)</sup></b>			
Employment	61	61	61
Earnings (\$000) <sup>(a)</sup>	1,199	1,199	1,199
<b>Reuse Increase over No-Action Effects</b>			
Employment			
Direct	572	979	1,473
Construction	17	14	14
Operations	555	965	1,459
Secondary	273	471	712
Total	845	1,450	2,185
Earnings (\$000) <sup>(a)</sup>			
Direct	11,497	21,245	33,419
Construction	466	373	373
Operations	11,031	20,872	33,046
Secondary	5,188	8,831	13,137
Total	16,685	30,076	46,556
<b>ROI Employment</b>			
With No-Action Alternative	34,151	34,734	35,604
With Reuse	34,996	36,184	37,789
<b>In-Migrating Workers<sup>(c)</sup></b>			
Direct	306	511	758
Construction	3	3	3
Operation	303	508	755
Secondary	28	48	72
Total	334	559	830

Notes: (a) Constant 1989 dollars.

(b) No-Action Alternative is the closure baseline projection, extended beyond closure, with the OL in place and the base in caretaker status. Effects include both direct and secondary employment and earnings.

(c) In-migrating workers are holders of site-related jobs and expected to live in the ROI with reuse but would not live in the ROI without reuse. Refer to Appendix B, Methods, for migratory employment assumptions.

**ROI Jobs with the Recreation Alternative.** The total number of jobs in the ROI would increase from 33,495 at closure to 34,996 in 1998, 36,184 in 2003, and 37,789 in 2013 (see Table 4.2-3). The average annual employment growth rate in the ROI would be 0.6 percent with the Recreation Alternative, compared to 0.3 percent for closure baseline. The trend in ROI employment for the Recreation Alternative compared to the 1993 closure baseline is shown in Figure 4.2-1.

**In-Migrating Workers.** About 63 percent of the jobs created by the Recreation Alternative are expected to be filled by area residents. Other jobs would be filled by workers relocating to the ROI. Relocation is expected to start for some types of jobs at the earliest stages of reuse. The total number of in-migrating workers is expected to be 334 in 1998, 559 in 2003, and 830 in 2013 (see Table 4.2-3).

#### **4.2.4 No-Action Alternative**

Employment and earnings effects under the No-Action Alternative would be the same as those described in Section 3.2 as closure conditions and as briefly highlighted in the introductory paragraph of this section.

### **4.3 POPULATION**

If no reuse of Wurtsmith AFB occurs, total population in the ROI is anticipated to increase from 78,139 in 1993 to 82,900 in 2013. These figures are preclosure population projections made by the Michigan Bureau of Management and Budget (1985), with the out-migrating population factored out. This represents an average annual growth of 0.3 percent. The effects on population would be the greatest for the Proposed Action of any of the reuse alternatives evaluated in this study.

**Population In-migration Assumptions.** As described in Appendix B, workers are projected to relocate to the region, depending on the number and types of jobs created. Many of the employment opportunities created by the reuse alternatives would be filled by individuals residing in the ROI due to the number of unemployed workers in the area. The balance of workers would relocate to the ROI with their dependents, creating ROI population in-migration. This in-migrating population also is expected to experience natural increase (births minus deaths) at regional average rates.

**Residential Distribution Assumptions.** In-migrants to the job market are expected to reside within the ROI based on 1992 population and commuting patterns. Direct workers are expected to choose places of residence similar to those of the civilian workers at the base prior to closure. Secondary workers would also likely have similar residential preferences.

#### 4.3.1 Proposed Action

**Site-Related Population.** Total site-related population includes both (a) those households where at least one member has a site-related job who would live in the ROI without the Proposed Action, and (b) those who would reside in the ROI because of the Proposed Action (the migratory population). The total site-related population is projected to increase to 14,709 in 1998, 18,041 in 2003, and 24,068 in 2013 (Table 4.3-1). The largest share (14,306) would reside in Iosco County by 2013, with 8,471 residing in Oscoda Township and 3,083 in Au Sable Township. Site-related population in Greenbush Township, in Alcona County, is projected at 2,177 in 2013.

**Table 4.3-1. Proposed Action: Site-Related Population**

	1998	2003	2013
<b>Persons by Labor Category of Employee</b>			
Direct	9,045	11,138	15,013
Construction	178	62	67
Operations	8,867	11,076	14,946
Secondary	5,664	6,903	9,055
ROI Total	14,709	18,041	24,068
<b>Persons by Location</b>			
Iosco County	8,729	10,710	14,306
Oscoda Township	5,164	6,337	8,471
Au Sable Township	1,879	2,307	3,083
Rest of County	1,686	2,066	2,752
Alcona County	4,456	5,469	7,305
Greenbush Township	1,327	1,629	2,177
Rest of County	3,129	3,840	5,128
Alpena County	1,147	1,402	1,853
Arenac County	377	460	604
ROI Total	14,709	18,041	24,068

**Notes:** Site-related employees and dependents represent all direct and secondary workers and their dependents residing in the region. These include persons who are projected to live in the ROI without reuse and consequently are a combination of migratory population change and baseline population.

**Migratory-Related Population Change.** The migratory-related population changes expected to occur due to the Proposed Action are shown in Table 4.3-2 for the ROI. These figures represent persons living in the ROI who would not live there without reuse of the base. Migratory population changes caused by the Proposed Action in excess of the No-Action Alternative are projected at 5,002 in 1998, 6,203 in 2003, and 8,352 in

**Table 4.3-2. Proposed Action: Total Regional Population Effects -  
Counties and Selected Communities  
Page 1 of 2**

	1998	2003	2013
<b>Migratory-Related Population Changes<sup>(a)</sup></b>			
<b>Reuse Effects</b>			
Iosco County	3,131	3,880	5,220
Oscoda Township	1,902	2,357	3,172
Au Sable Township	693	859	1,156
Rest of County	536	664	892
Alcona County	1,615	2,002	2,693
Greenbush Township	491	609	819
Rest of County	1,124	1,393	1,874
Alpena County	242	298	399
Arenac County	49	60	80
ROI Total	5,037	6,240	8,392
<b>No-Action Effects<sup>(b)</sup></b>			
Iosco County	22	23	25
Oscoda Township	13	14	15
Au Sable Township	5	5	6
Rest of County	4	4	4
Alcona County	11	12	13
Greenbush Township	3	4	4
Rest of County	8	8	9
Alpena County	2	2	2
Arenac County	0	0	0
ROI Total	35	37	40
<b>Reuse Increase over No-Action Effects</b>			
Iosco County	3,109	3,857	5,195
Oscoda Township	1,889	2,343	3,157
Au Sable Township	688	854	1,150
Rest of County	532	660	888
Alcona County	1,604	1,990	2,680
Greenbush Township	488	605	815
Rest of County	1,116	1,385	1,865
Alpena County	240	296	397
Arenac County	49	60	80
ROI Total	5,002	6,203	8,352

Notes: (a) Migratory-related population change represents those site-related employees and dependents living in the region who would not live in the region without reuse. All other site-related employees and dependents would live in the region without reuse of the base.  
(b) No-Action effects result from OL activities on the site.



**Table 4.3-2. Proposed Action: Total Regional Population Effects -  
Counties and Selected Communities**

**Page 2 of 2**

	1998	2003	2013
<b>ROI Population Projections</b>			
<b>With No-Action Alternative</b>			
Isco County	22,615	22,643	22,463
Oscoda Township	5,171	5,174	5,168
Au Sable Township	1,612	1,614	1,600
Rest of County	15,832	15,855	15,695
Alcona County	10,314	10,877	11,929
Greenbush Township	1,260	1,375	1,587
Rest of County	9,054	9,502	10,342
Alpena County	30,278	29,993	29,113
Arenac County	16,412	17,421	19,395
ROI Total	79,619	80,934	82,900
<b>With Proposed Action</b>			
Isco County	25,724	26,500	27,658
Oscoda Township	7,060	7,517	8,325
Au Sable Township	2,300	2,468	2,750
Rest of County	16,364	16,515	16,583
Alcona County	11,918	12,867	14,609
Greenbush Township	1,748	1,980	2,402
Rest of County	10,170	10,887	12,207
Alpena County	30,518	30,289	29,510
Arenac County	16,461	17,481	19,475
ROI Total	84,621	87,137	91,252

Notes: (a) Migratory-related population change represents those site-related employees and dependents living in the region who would not live in the region without reuse. All other site-related employees and dependents would live in the region without reuse of the base.  
(b) No-Action effects result from OL activities on the site.

2013. In 2013, 5,195 (more than 62 percent of the ROI total) are expected to live in Iosco County. It is further estimated that 3,157 (nearly 38 percent) would live in Oscoda Township and 1,150 (nearly 14 percent) in Au Sable Township. Another 815 in-migrants (less than 10 percent of the ROI total) would move into Greenbush Township in 2013.

**ROI Population with the Proposed Action.** Population in the ROI would increase from 78,139 at closure to 84,621 in 1998, 87,137 in 2003, and 91,252 in 2013 (Table 4.3-2). The average annual rate of population growth in the ROI during this 20-year period would be 0.8 percent, compared to 0.3 percent for the 1993 closure baseline. The projected ROI population is presented in Figure 4.3-1.

#### **4.3.2 Fire Training Alternative**

**Site-Related Population.** The total site-related population is projected to increase to 5,886 in 1998, 9,065 in 2003, and 13,022 in 2013 (Table 4.3-3). Nearly all of these persons would be associated with direct operations jobs and secondary employment. By 20 years after closure 7,812 of these persons would reside in Iosco County, with 4,651 residing in Oscoda Township and 1,693 in Au Sable Township. Greenbush Township would have 1,197 site-related residents.

**Migratory-Related Population Change.** The migratory-related population changes expected to occur in the ROI are shown in Table 4.3-4. These numbers represent persons who would not be living in the ROI without reuse of the base. Population changes projected to occur as a result of the Fire Training Alternative, in excess of the No-Action Alternative, are 2,148 in 1998, 3,275 in 2003, and 4,749 in 2013. It is projected that more than 62 percent (2,964) of the ROI total would live in Iosco County in 2013, and 1,805, or about 38 percent, in Oscoda.

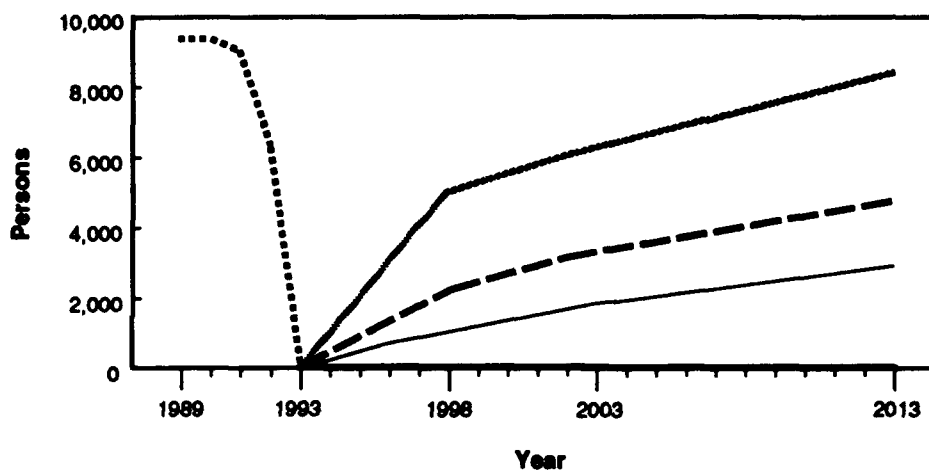
**ROI Population with the Fire Training Alternative.** Population in the ROI would increase from 78,139 at closure to 81,767 in 1998, 84,209 in 2003, and 87,649 in 2013 (Table 4.3-4). The average annual growth rate for population in the ROI during this 20-year period would be 0.6 percent compared with 0.3 percent under 1993 baseline closure conditions. The trend in ROI population with the Fire Training Alternative is presented in Figure 4.3-1.

#### **4.3.3 Recreation Alternative**

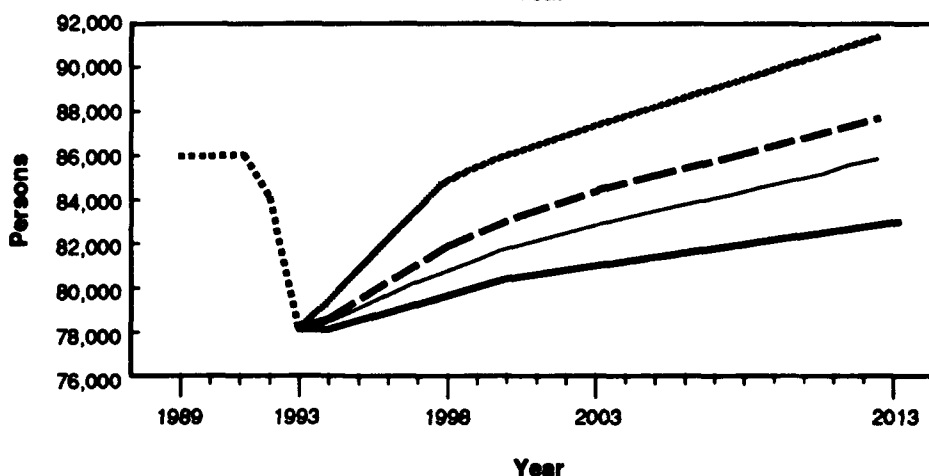
**Site-Related Population.** The total site-related population is projected to increase to 2,752 in 1998, 4,809 in 2003, and 7,802 in 2013 (Table 4.3-5). Nearly all of this increase would be attributable to direct operations jobs and secondary employment. In 2013, Iosco County would have 4,679 persons, with 2,785 residing in Oscoda Township and 1,014 in

ALTERNATIVE	1993	1998	2003	2013
Proposed Action	0	5,002	6,203	8,352
Fire Training	0	2,148	3,275	4,749
Recreation	0	977	1,736	2,835
No-Action	0	0	0	0

**Migratory-Related  
Population  
Effects**



**Migratory-Related  
Population  
Effects**



**Total ROI  
Population  
Including  
Reuse  
Effects**

#### EXPLANATION

- ..... Preclosure
- Proposed Action
- Fire Training Alternative
- Recreation Alternative
- No-Action/Post-Closure

#### Migratory-Related Population Effects

Note: Migratory-related population effects are the persons that would move into the ROI solely as a result of reuse.

**Figure 4.3-1**

**Table 4.3-3. Fire Training Alternative: Site-Related Population**

	1998	2003	2013
<b>Persons by Labor Category of Employee</b>			
Direct	4,112	6,109	8,824
Construction	169	127	139
Operations	3,943	5,982	8,685
Secondary	1,774	2,956	4,198
ROI Total	5,886	9,065	13,022
<b>Persons by Location</b>			
Iosco County	3,544	5,435	7,812
Oscoda Township	2,114	3,235	4,651
Au Sable Township	770	1,177	1,693
Rest of County	660	1,023	1,468
Alcona County	1,815	2,781	3,998
Greenbush Township	544	832	1,197
Rest of County	1,271	1,949	2,801
Alpena County	405	648	926
Arenac County	122	201	286
ROI Total	5,886	9,065	13,022

Notes: Site-related employees and dependents represent all direct and secondary workers and their dependents residing in the region. These include persons who are projected to live in the ROI without reuse and consequently are a combination of migratory-related population change and baseline population.

Au Sable Township. Greenbush, in Alcona County, would have 717 persons.

**Migratory-Related Population Change.** The migratory-related population changes expected to occur in the ROI are shown in Table 4.3-6. These figures represent persons who would not be living in the ROI without reuse of the base. Population changes caused by the Recreation Alternative in excess of the No-Action Alternative are projected to be 977 in 1998, 1,736 in 2003, and 2,835 in 2013. Of the population in-migrating to the ROI by 2013, it is projected that 1,770, or more than 62 percent, would live in Iosco County, of which 1,078 would live in Oscoda.

**ROI Population with the Recreation Alternative.** As a result of the Recreation Alternative, the ROI population would increase from 78,139 at closure to 80,596 in 1998, 82,670 in 2003, and 85,735 in 2013 (Table 4.3-6). The average annual growth rate for population in the ROI during this 20-year period would be about 0.5 percent, compared to 0.3 percent under 1993 closure baseline conditions. The trend in ROI population with the Recreation Alternative is shown in Figure 4.3-1.

**Table 4.3-4. Fire Training Alternative: Total Regional Population Effects -  
Counties and Selected Communities  
Page 1 of 2**

	1998	2003	2013
<b>Migratory-Related Population Changes<sup>(a)</sup></b>			
<b>Reuse Effects</b>			
Iosco County	1,364	2,066	2,989
Oscoda Township	831	1,258	1,820
Au Sable Township	303	458	663
Rest of County	230	350	506
Alcona County	705	067	1,543
Greenbush Township	215	325	470
Rest of County	490	742	1,073
Alpena County	97	151	217
Arenac County	17	28	40
ROI Total	2,183	3,312	4,789
<b>No-Action Effects<sup>(b)</sup></b>			
Iosco County	22	23	25
Oscoda Township	13	14	15
Au Sable Township	5	5	6
Rest of County	4	4	4
Alcona County	11	12	13
Greenbush Township	3	4	4
Rest of County	8	8	9
Alpena County	2	2	2
Arenac County	0	0	0
ROI Total	35	37	40
<b>Reuse Increase over No-Action Effects</b>			
Iosco County	1,342	2,043	2,964
Oscoda Township	818	1,244	1,805
Au Sable Township	298	453	657
Rest of County	226	346	502
Alcona County	694	1,055	1,530
Greenbush Township	212	321	466
Rest of County	482	734	1,064
Alpena County	95	149	215
Arenac County	17	28	40
ROI Total	2,148	3,275	4,749

Notes: (a) Migratory-related population change represents those site-related employees and dependents living in the region who would not live in the region without reuse. All other site-related employees and dependents would live in the region without reuse of the base.  
(b) No-Action effects result from OL activities on the site.

**Table 4.3-4. Fire Training Alternative: Total Regional Population Effects -  
Counties and Selected Communities  
Page 2 of 2**

	1998	2003	2013
<b>ROI Population Projections</b>			
<b>With No-Action Alternative</b>			
Iosco County	22,615	22,643	22,463
Oscoda Township	5,171	5,174	5,168
Au Sable Township	1,612	1,614	1,600
Rest of County	15,832	15,855	15,695
Alcona County	10,314	10,877	11,929
Greenbush Township	1,260	1,375	1,587
Rest of County	9,054	9,502	10,342
Alpena County	30,278	29,993	29,113
Arenac County	16,412	17,421	19,395
ROI Total	79,619	80,934	82,900
<b>With Fire Training Alternative</b>			
Iosco County	23,957	24,686	25,427
Oscoda Township	5,990	6,418	6,973
Au Sable Township	1,910	2,067	2,257
Rest of County	16,057	16,201	16,197
Alcona County	11,008	11,932	13,459
Greenbush Township	1,472	1,696	2,053
Rest of County	9,536	10,236	11,406
Alpena County	30,373	30,142	29,328
Arenac County	16,429	17,449	19,435
ROI Total	81,767	84,209	87,649

Notes: (a) Migratory-related population change represents those site-related employees and dependents living in the region who would not live in the region without reuse. All other site-related employees and dependents would live in the region without reuse of the base.  
(b) No-Action effects result from OL activities on the site.

**Table 4.3-5. Recreation Alternative: Site-Related Population**

	1998	2003	2013
<b>Persons by Labor Category of Employee</b>			
Direct	1,883	3,265	5,276
Construction	52	46	50
Operations	1,831	3,219	5,226
Secondary	869	1,544	2,526
ROI Total	2,752	4,809	7,802
<b>Persons by Location</b>			
Iosco County	1,653	2,886	4,679
Oscoda Township	985	1,719	2,785
Au Sable Township	358	625	1,014
Rest of County	310	542	880
Alcona County	846	1,477	2,395
Greenbush Township	253	442	717
Rest of County	593	1,035	1,678
Alpena County	194	341	556
Arenac County	59	105	172
ROI Total	2,752	4,809	7,802

Notes: Site-related employees and dependents represent all direct and secondary workers and their dependents residing in the region. These include persons who are projected to live in the ROI without reuse and consequently are a combination of migratory-related population change and baseline population.

#### **4.3.4 No-Action Alternative**

Population effects under the No-Action Alternative would be similar to those described in Section 3.3 as 1993 closure conditions and briefly highlighted in the introductory paragraph of this section.

#### **4.4 HOUSING**

Total nonseasonal housing demand in the ROI is estimated to be 31,729 units at closure. Due to population growth, housing demand is projected to increase to 32,314 units in 1998, 32,826 in 2003, and 33,576 in 2013. This represents an average annual growth rate of 0.3 percent for this 20-year period, comparable to the projected growth in population. The greatest demand for housing in the ROI is expected to occur for the Proposed Action.

**Table 4.3-6. Recreation Alternative: Total Regional Population Effects -  
Counties and Selected Communities**  
Page 1 of 2

	1998	2003	2013
<b>Migratory-Related Population Changes<sup>(a)</sup></b>			
<b>Reuse Effects</b>			
Iosco County	632	1,107	1,795
Oscoda Township	385	674	1,093
Au Sable Township	140	246	398
Rest of County	107	187	304
Alcona County	326	571	926
Greenbush Township	99	174	282
Rest of County	227	397	644
Alpena County	46	80	130
Arenac County	8	15	24
ROI Total	1,012	1,773	2,875
<b>No-Action Effects<sup>(b)</sup></b>			
Iosco County	22	23	25
Oscoda Township	13	14	15
Au Sable Township	5	5	6
Rest of County	4	4	4
Alcona County	11	12	13
Greenbush Township	3	4	4
Rest of County	8	8	9
Alpena County	2	2	2
Arenac County	0	0	0
ROI Total	35	37	40
<b>Reuse Increase over No-Action Effects</b>			
Iosco County	610	1,084	1,770
Oscoda Township	372	660	1,078
Au Sable Township	135	241	392
Rest of County	103	183	300
Alcona County	315	559	913
Greenbush Township	96	170	278
Rest of County	219	389	635
Alpena County	44	78	128
Arenac County	8	15	24
ROI Total	977	1,736	2,835

Notes: (a) Migratory-related population change represents those site-related employees and dependents living in the region who would not live in the region without reuse. All other site-related employees and dependents would live in the region without reuse of the base.  
(b) No-Action effects result from OL activities on the site.



**Table 4.3-6. Recreation Alternative: Total Regional Population Effects -  
Counties and Selected Communities**

**Page 2 of 2**

	1998	2003	2013
<b>ROI Population Projections</b>			
<b>With No-Action Alternative</b>			
Iosco County	22,615	22,643	22,463
Oscoda Township	5,171	5,174	5,168
Au Sable Township	1,612	1,614	1,600
Rest of County	15,832	15,855	15,695
Alcona County	10,314	10,877	11,929
Greenbush Township	1,260	1,375	1,587
Rest of County	9,054	9,502	10,342
Alpena County	30,278	29,993	29,113
Arenac County	16,412	17,421	19,395
ROI Total	79,619	80,934	82,900
<b>With Reuse</b>			
Iosco County	23,225	23,727	24,233
Oscoda Township	5,543	5,834	6,246
Au Sable Township	1,747	1,855	1,992
Rest of County	15,935	16,038	15,995
Alcona County	10,629	11,436	12,842
Greenbush Township	1,356	1,545	1,865
Rest of County	9,273	9,891	10,977
Alpena County	30,322	30,071	29,241
Arenac County	16,420	17,436	19,419
ROI Total	80,596	82,670	85,735

Notes: (a) Migratory-related population change represents those site-related employees and dependents living in the region who would not live in the region without reuse. All other site-related employees and dependents would live in the region without reuse of the base.  
(b) No-Action effects result from OL activities on the site.

#### **4.4.1 Proposed Action**

**Migratory-Related Housing Demand.** Demand caused by the Proposed Action associated with population in-migration in excess of the No-Action Alternative is projected to be 1,719 units in the ROI in 1998, 2,130 units in 2003, and 2,870 units in 2013 (Table 4.4-1). Approximately 62 percent of this demand is projected to occur in Iosco County, including 38 percent in Oscoda Township. About 32 percent of the housing demand effects would occur in Alcona County.

**ROI Housing Demand with the Proposed Action.** Total nonseasonal housing demand with the Proposed Action is projected to increase from 31,729 units at closure to 34,033 units in 1998, 34,957 units in 2003, and 36,446 units in 2013 (Table 4.4-1). This growth rate in housing demand averages 0.7 percent per year for this 20-year period, compared to 0.3 percent annually under 1993 closure baseline conditions.

#### **4.4.2 Fire Training Alternative**

**Migratory-Related Housing Demand.** Demand attributable to the Fire Training Alternative, in excess of the No-Action Alternative, is projected to be 738 units in the ROI in 1998, 1,126 units in 2003, and 1,633 units in 2013 (Table 4.4-2). More than 62 percent of this demand is projected to occur in Iosco County, including 38 percent in Oscoda Township. About 32 percent would occur in Alcona County.

**ROI Housing Demand with the Fire Training Alternative.** Nonseasonal demand is projected to rise from 31,729 units at closure to 33,052 units in 1998, 33,952 units in 2003, and 35,209 units in 2013 (Table 4.4-2). This projected increase in demand averages 0.5 percent annually, which is less rapid than under the Proposed Action (0.7 percent) but faster than the 1993 closure baseline conditions (0.3 percent).

#### **4.4.3 Recreation Alternative**

**Migratory-Related Housing Demand.** Demand caused by the Recreation Alternative in excess of the No-Action Alternative is projected at 336 units in the ROI in 1998, 596 units in 2003, and 976 units in 2013 (Table 4.4-3). More than 60 percent of this demand is projected to occur in Iosco County, including 38 percent in Oscoda Township. Approximately 32 percent would occur in Alcona County.

**ROI Housing Demand with the Recreation Alternative.** Demand is forecast to increase from 31,729 at closure to 32,650 in 1998, 33,422 in 2003, and 34,552 in 2013 (Table 4.4-3). This change averages 0.4 percent per year, slightly greater than the 1993 closure baseline projection of 0.3 percent.

**Table 4.4-1. Proposed Action: Total Regional Housing Effects -  
Counties and Selected Communities (number of housing units)  
Page 1 of 2**

	1998	2003	2013
<b>Migratory-Related Housing Demand<sup>(a)</sup></b>			
<b>Reuse Demand</b>			
Iosco County	1,076	1,333	1,794
Oscoda Township	654	810	1,090
Au Sable Township	238	295	397
Rest of County	184	228	307
Alcona County	555	688	925
Greenbush Township	169	209	281
Rest of County	386	479	644
Alpena County	83	102	137
Arenac County	17	21	27
ROI Total	1,731	2,144	2,883
<b>No-Action Demand<sup>(b)</sup></b>			
Iosco County	7	8	8
Oscoda Township	4	5	5
Au Sable Township	2	2	2
Rest of County	1	1	1
Alcona County	4	4	4
Greenbush Township	1	1	1
Rest of County	3	3	3
Alpena County	1	1	1
Arenac County	0	0	0
ROI Total	12	13	13
<b>Reuse Increase over No-Action Alternative</b>			
Iosco County	1,069	1,325	1,786
Oscoda Township	650	805	1,085
Au Sable Township	236	293	395
Rest of County	183	227	306
Alcona County	551	684	921
Greenbush Township	168	208	280
Rest of County	383	476	641
Alpena County	82	101	136
Arenac County	17	21	27
ROI Total	1,719	2,131	2,870

Notes: (a) Migratory-related housing demand is attributable to migratory ROI population changes. It reflects the change in housing demand, compared to baseline conditions, required to house the change in ROI population caused by reuse.

(b) No-Action demand results from OL activities on the site.

**Table 4.4-1. Proposed Action: Total Regional Housing Effects -  
Counties and Selected Communities (Number of Housing units)  
Page 2 of 2**

	1998	2003	2013
<b>ROI Housing Demand</b>			
<b>With No-Action Alternative</b>			
Iosco County	9,875	9,888	9,809
Oscoda Township	2,432	2,434	2,431
Au Sable Township	852	853	845
Rest of County	6,591	6,601	6,533
Alcona County	4,395	4,634	5,082
Greenbush Township	580	632	730
Rest of County	3,815	4,002	4,352
Alpena County	11,981	11,868	11,520
Arenac County	6,063	6,436	7,165
ROI Total	32,314	32,826	33,576
<b>With Reuse</b>			
Iosco County	10,944	11,213	11,595
Oscoda Township	3,082	3,239	3,516
Au Sable Township	1,088	1,146	1,240
Rest of County	6,774	6,828	6,839
Alcona County	4,946	5,318	6,003
Greenbush Township	748	840	1,010
Rest of County	4,198	4,478	4,993
Alpena County	12,063	11,969	11,656
Arenac County	6,080	6,457	7,192
ROI Total	34,033	34,957	36,446

**Notes:** (a) Migratory-related housing demand is attributable to migratory ROI population changes. It reflects the change in housing demand, compared to baseline conditions, required to house the change in ROI population caused by reuse.  
(b) No-Action demand results from OL activities on the site.

**Table 4.4-2. Fire Training Alternative: Total Regional Housing Effects - Counties and Selected Communities (number of housing units)**

Page 1 of 2

	1998	2003	2013
<b>Migratory-Related Housing Demand<sup>(a)</sup></b>			
<b>Reuse Demand</b>			
Iosco County	469	710	1,027
Oscoda Township	286	432	625
Au Sable Township	104	157	228
Rest of County	79	121	174
Alcona County	242	367	530
Greenbush Township	74	112	162
Rest of County	168	255	368
Alpena County	33	52	75
Arenac County	6	10	14
ROI Total	750	1,139	1,646
<b>No-Action Demand<sup>(b)</sup></b>			
Iosco County	7	8	8
Oscoda Township	4	5	5
Au Sable Township	2	2	2
Rest of County	1	1	1
Alcona County	4	4	4
Greenbush Township	1	1	1
Rest of County	3	3	3
Alpena County	1	1	1
Arenac County	0	0	0
ROI Total	12	13	13
<b>Reuse Increase over No-Action Alternative</b>			
Iosco County	462	702	1,019
Oscoda Township	282	427	620
Au Sable Township	102	155	226
Rest of County	78	120	173
Alcona County	238	363	526
Greenbush Township	73	111	161
Rest of County	165	252	365
Alpena County	32	51	74
Arenac County	6	10	14
ROI Total	738	1,126	1,633

Notes: (a) Migratory-related housing demand is attributable to migratory ROI population changes. It reflects the change in housing demand, compared to baseline conditions, required to house the change in ROI population caused by reuse.

(b) No-Action demand results from OL activities on the site.

**Table 4.4-2. Fire Training Alternative: Total Regional Housing Effects - Counties and Selected Communities (number of housing units)**  
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	1998	2003	2013
<b>ROI Housing Demand</b>			
<b>With No-Action Alternative</b>			
Iosco County	9,875	9,888	9,809
Oscoda Township	2,432	2,434	2,431
Au Sable Township	852	853	845
Rest of County	6,591	6,601	6,533
Alcona County	4,395	4,634	5,082
Greenbush Township	580	632	730
Rest of County	3,815	4,002	4,352
Alpena County	11,981	11,868	11,520
Arenac County	6,063	6,436	7,165
ROI Total	32,314	32,826	33,576
<b>With Fire Training Alternative</b>			
Iosco County	10,337	10,590	10,828
Oscoda Township	2,714	2,861	3,051
Au Sable Township	954	1,008	1,071
Rest of County	6,669	6,721	6,706
Alcona County	4,633	4,997	5,608
Greenbush Township	653	743	891
Rest of County	3,980	4,254	4,717
Alpena County	12,013	11,919	11,594
Arenac County	6,069	6,446	7,179
ROI Total	33,052	33,952	35,209

**Notes:** (a) Migratory-related housing demand is attributable to migratory ROI population changes. It reflects the change in housing demand, compared to baseline conditions, required to house the change in ROI population caused by reuse.  
(b) No-Action demand results from OL activities on the site.

**Table 4.4-3. Recreation Alternative: Total Regional Housing Effects - Counties and Selected Communities (number of housing units)**  
**Page 1 of 2**

	1998	2003	2013
<b>Migratory-Related Housing Demand<sup>(a)</sup></b>			
<b>Reuse Demand</b>			
Iosco County	217	381	617
Oscoda Township	132	232	376
Au Sable Township	48	85	137
Rest of County	37	64	104
Alcona County	112	196	319
Greenbush Township	34	60	97
Rest of County	78	136	222
Alpena County	16	27	45
Arenac County	3	5	8
ROI Total	348	609	989
<b>No-Action Demand<sup>(b)</sup></b>			
Iosco County	7	8	8
Oscoda Township	4	5	5
Au Sable Township	2	2	2
Rest of County	1	1	1
Alcona County	4	4	4
Greenbush Township	1	1	1
Rest of County	3	3	3
Alpena County	1	1	1
Arenac County	0	0	0
ROI Total	12	13	13
<b>Reuse Increase over No-Action Alternative</b>			
Iosco County	210	373	609
Oscoda Township	128	227	371
Au Sable Township	46	83	135
Rest of County	36	63	103
Alcona County	108	192	315
Greenbush Township	33	59	96
Rest of County	75	133	219
Alpena County	15	26	44
Arenac County	3	5	8
ROI Total	336	596	976

Notes (a) Migratory-related housing demand is attributable to migratory ROI population changes. It reflects the change in housing demand, compared to baseline conditions, required to house the change in ROI population caused by reuse.

(b) No-Action demand results from OL activities on the site.

**Table 4.4-3. Recreation Alternative: Total Regional Housing Effects - Counties and Selected Communities (number of housing units)**  
**Page 2 of 2**

	1998	2003	2013
<b>ROI Housing Demand</b>			
Iosco County	9,875	9,888	9,809
Oscoda Township	2,432	2,434	2,431
Au Sable Township	852	853	845
Rest of County	6,591	6,601	6,533
Alcona County	4,395	4,634	5,082
Greenbush Township	580	632	730
Rest of County	3,815	4,002	4,352
Alpena County	11,981	11,868	11,520
Arenac County	6,063	6,436	7,165
ROI Total	32,314	32,826	33,576
<b>With Recreation Alternative</b>			
Iosco County	10,085	10,261	10,418
Oscoda Township	2,560	2,661	2,802
Au Sable Township	898	936	980
Rest of County	6,627	6,664	6,636
Alcona County	4,503	4,826	5,397
Greenbush Township	613	691	826
Rest of County	3,890	4,135	4,571
Alpena County	11,996	11,894	11,564
Arenac County	6,066	6,441	7,173
ROI Total	32,650	33,422	34,552

Notes: (a) Migratory-related housing demand is attributable to migratory ROI population changes. It reflects the change in housing demand, compared to baseline conditions, required to house the change in ROI population caused by reuse.  
 (b) No-Action demand results from OL activities on the site.



Demand for housing under this alternative would be at a slower rate than under either the Proposed Action or the Fire Training Alternative.

#### **4.4.4 No-Action Alternative**

Housing effects under the No-Action Alternative would be similar to those described in Section 3.4 as 1993 closure conditions and briefly highlighted in the introductory paragraph of this section.

### **4.5 PUBLIC SERVICES**

Effects to key local public services are determined by the change in demand for service personnel and facilities arising from project implementation. The ability to accommodate increased demand or to respond to decreases in demand while maintaining accustomed levels of local public service is examined based on potential changes in demand for services.

Effects to public services would arise from ROI population in-migration and consequent changes in public service demand. The number of in-migrating workers at the site, their accompanying dependents, and their settlement patterns would affect public service demand throughout the ROI. Levels of public service for 1992 (student-teacher ratios and governmental/health care employee per 1,000 population ratios) were used as standards of service requirements. Potential project effects were determined by the addition of public service employees (e.g., municipal employees, school teaching staff, police officers, fire fighters, health care providers) required to serve the resulting in-migrating population. Staffing to population service ratios are used to compare effects between the alternatives only, and are not intended to suggest future staffing requirements.

Based on the expected growth pattern associated with reuse, public service effects were projected for those jurisdictions that would be most affected by changes in service demand. These jurisdictions include Iosco and Alcona counties; the townships of Oscoda, Au Sable, and Greenbush; and Oscoda Area Schools and Tawas Area Schools.

Other direct effects would focus on increased service demand resulting from additional area and infrastructure arising from the shift from the federal administration of Wurtsmith AFB to local jurisdiction over the project area. Following disposition of any parcel to the private sector, Oscoda would become responsible for serving the demand for municipal services, police protection, fire protection, and health care over the base area. Also, local service providers would lose Air Force support in the form of aid agreements (e.g., for fire protection). Of the reuse alternatives evaluated in this study, the Proposed Action would affect local government services the most.

#### **4.5.1 Local Government**

Potential effects to local government structure and employment are examined for each alternative. The analysis considers project-related population in-migration and changes in service area infrastructure responsibility resulting under each alternative. Because of the magnitude of some effects of closure and reuse, level-of-service ratios may not adequately meet new service requirements. Changes in land area served and types of services to be provided were considered.

**Area-Generated Employee Demand.** The site is located within Oscoda Township, and administration of the site would become the responsibility of the township during reuse. Services, such as public works, utilities, building code inspection and enforcement, and recreation, would need to be expanded for the additional area and infrastructure requirements. Regardless of changes in site-related population, increases in township employment and facilities infrastructure may be required to serve this area, in addition to the calculated per-capita increases. Therefore, the total local government employee demands would be the summation of per-capita demands and area-generated demands.

With Wurtsmith AFB closed and in caretaker status (the No-Action Alternative), OL activities at the site would not generate demand for local government services. As a result, municipal staffing levels would not have to be increased for any of the local jurisdictions. Effects of each of the reuse alternatives are compared to these 1993 closure baseline conditions.

##### **4.5.1.1 Proposed Action**

**Iosco County.** Based on per-capita calculations, Iosco County would experience the greatest increase in demand for government service in the region resulting from the Proposed Action. Under the Proposed Action, Iosco County would experience a population increase of 3,109 persons by 1998, 3,857 persons by 2003, and 5,195 persons by 2013, or approximately 62 percent of the total population change due to in-migration to the ROI in 2013. To maintain 1992 service levels of 4.3 county employees per 1,000 persons, per-capita increases in employment by the county for site-related activities would be 13 employees in 1998 and 22 in 2013 (Table 4.5-1). This increase in county employees represents a 23-percent increase in staffing by 2013 over 1993 (closure baseline) levels of 97 FTE employees.

**Alcona County.** Alcona County would experience a population increase of 1,604 persons by 1998, 1,990 persons by 2003, and 2,680 persons by 2013, or 32 percent of the total increase in population due to in-migration to the ROI. This would generate a per-capita increase in public service employment of 10 personnel by 1998 and 16 by 2013 in order to maintain

**Table 4.5-1. Proposed Action: Government Employment Effects**

	1998	2003	2013
Iosco County	13	17	22
Alcona County	10	12	16
Oscoda Township	6	8	10
Total	29	37	48

Notes: Effects of migratory-related population changes on local government employment requirements, excluding teachers, police officers, and fire fighters, which are analyzed separately. Area-generated employee demand is not included in this table.

the 1992 level of service of 6.0 FTE county employees per 1,000 persons (see Table 4.5-1). This is a 28-percent increase in staffing by 2013 over 1993 (closure baseline) levels of 57 FTE employees.

Oscoda Township. In order to maintain the 1992 level of service of 3.3 employees per 1,000 persons, municipal staffing would increase in Oscoda to accommodate an in-migrating population of 1,889 by 1998, 2,343 by 2003, and 3,157 by 2013. By 1998, the township would require 6 additional FTE employees, increasing to a total of 10 by 2013 (see Table 4.5-1). By 2013, these additional employees would increase staffing by 63 percent over the 1993 (closure baseline) level of 16 employees. Based on a 1992 area-generated level-of-service ratio of 780 developed acres per employee, Oscoda could require an increase of up to four employees, in addition to the calculated per-capita increases, to serve the additional area created by the development of 3,364 acres. The township would be responsible for providing government services (excluding acreage in airfield and aviation support uses assumed to be the responsibility of a separate airport authority) to this newly developed area.

Other Jurisdictions. The townships of Au Sable and Greenbush would also experience increased demand for local government services due to in-migration. Under the Proposed Action, Au Sable's population would increase by 1,150 persons by 2013 or 13.8 percent of the total ROI increase in in-migration. Greenbush would gain 815 persons, or 9.8 percent of the ROI total migratory population increase. However, these two rural townships, based primarily on part-time and part-paid personnel, would probably not require additional municipal personnel to maintain existing service levels. Existing staff levels could satisfy the increased service demands with increased service hours proportional to population increases.

#### 4.5.1.2 Fire Training Alternative

losco County. Under the Fire Training Alternative, losco County would experience an increase in population due to in-migration of 1,342 persons by 1998, 2,043 persons by 2003, and 2,964 by 2013. With approximately 62 percent of the total population increase in-migrating to the ROI, losco County would have the greatest increase in demand for government services. County employment related to activities at the project site would increase by 6 employees in 1998 and 13 in 2013 in order to maintain 1992 service levels of 4.3 county employees per 1,000 persons (Table 4.5-2). Staffing levels under this alternative would represent a 14-percent increase by the year 2013 over 1993 (closure baseline) conditions in losco County (97 municipal FTE employees).

**Table 4.5-2. Fire Training Alternative: Government Employment Effects**

	1998	2003	2013
losco County	6	9	13
Alcona County	4	6	9
Oscoda Township	3	4	6
Total	13	19	28

Note: Effects of migratory-related population changes on local government employment requirements, excluding teachers, police officers, and fire fighters, which are analyzed separately. Area-generated employee demand is not included in this table.

Alcona County. The second largest increase in public service demand under the Fire Training Alternative would be in Alcona County, based on population in-migration of 694 persons in 1998, 1,055 persons in 2003, and 1,530 persons in 2013. This would require an increase in county staffing levels of four personnel by 1998 and nine personnel by 2013 to maintain the 1992 level of municipal services of 6.0 FTE employees per 1,000 persons (see Table 4.5-2). By 2013, potential increases in county staff levels would represent a 16-percent increase over 1993 (closure baseline) staff levels of 57 FTE employees.

Oscoda Township. Municipal staffing for Oscoda Township would have to increase under this alternative to maintain its level of service of 3.3 FTE employees per 1,000 persons, and accommodate increased service demands from in-migration of 818 persons by 1998 and 1,805 persons by 2013. By 1998, the township would require three additional employees, increasing to a total of six by 2013 (see Table 4.5-2). These additional township employees would increase 1993 (closure baseline) staff levels by 38 percent by 2013.

As with the Proposed Action, 1992 service area per government employee levels for the township (780 acres per employee) could require up to five additional employees to serve the additional 3,505 serviceable acres created by reuse under this alternative by 2013.

**Other Jurisdictions.** Under the Fire Training alternative, the population increase in Au Sable and Greenbush would be about half that projected for the Proposed Action (657 and 460 respectively, by 2013). Similar to the Proposed Action, municipal service demand increases for these two townships could be met by increased service hours for existing employees in proportion to population increases, in order to maintain existing service levels.

#### 4.5.1.3 Recreation Alternative

**Iosco County.** By 1998, in-migration into Iosco County would total 610 persons, increasing to 1,084 persons by 2003, and 1,770 persons by 2013. Using a 1992 staffing level of 4.3 county FTE employees per 1,000 persons, three employees would have to be added under the Recreation Alternative in 1998 and eight in 2013 to maintain the same service levels (Table 4.5-3). By 2013, this alternative would increase county staff levels by 8 percent over the 97 employees remaining in 1993 (closure baseline).

**Table 4.5-3. Recreation Alternative: Government Employment Effects**

	1998	2003	2013
Iosco County	3	5	8
Alcona County	2	3	5
Oscoda Township	1	2	4
<b>Total</b>	<b>6</b>	<b>10</b>	<b>17</b>

**Note:** Effects of migratory-related population changes on local government employment requirement, excluding teachers, police officers, and fire fighters which are analyzed separately. Area-generated employee demand is not included in this table.

**Alcona County.** Alcona County would have to increase municipal staff in order to maintain the 1992 level of service of 6.0 FTE employees per 1,000 persons. To accommodate increased service demands created by 315 to 913 people in-migrating to the country between 1998 and 2013, the country would need to increase its staff by two personnel in 1998 and five by 2013 (Table 4.5-3). This would represent an 8.8-percent increase by the year 2013 over the 1993 (closure baseline) level of 57 employees.

**Oscoda Township.** To maintain the level of service at 3.3 FTE employees per 1,000 persons, one additional employee would be required in Oscoda by 1998, and four additional personnel by 2013, in order to meet increased service demands generated by 372 to 1,078 people migrating into the township during this period (see Table 4.5-3). Compared to a 1993 (closure baseline) level of 16 employees, the Recreation Alternative would generate a 25-percent increase in township staff levels by 2013.

As with the other alternatives, area-generated service demands could require as many as six additional employees to serve the 4,529 serviceable acres to be developed under the Recreation Alternative by 2013.

**Other Jurisdictions.** With in-migrating population increases of 392 persons for Au Sable and 278 persons for Greenbush by 2013, municipal service demand increases for these two rural townships could be met by increases in service hours for existing employees proportional to the population increases, in order to maintain existing service levels under this alternative.

#### **4.5.1.4 No-Action Alternative**

Local government effects of the No-Action Alternative would be the same as those described in Section 3.5 as closure conditions, and as highlighted in the introduction to Section 4.5.1.

#### **4.5.2 Public Education**

Potential effects to education services and facilities are examined for each alternative. The analysis considers project-related population change and its effect on local enrollments and teaching staff strengths.

The 1992 facility capacity for Oscoda Area Schools and Tawas Areas Schools would be sufficient to accommodate the expected migratory-related student enrollments under the Proposed Action and for each alternative. The 1992 student-teacher ratios of 18.9 for Oscoda Area Schools and 21.6 for Tawas Area Schools were maintained in the projections for the Proposed Action and each alternative.

##### **4.5.2.1 Proposed Action**

**Oscoda Area Schools.** Student enrollments in the Oscoda Area Schools are projected to increase by 887 in 1998, 1,101 in 2003, and 1,484 in 2013 (Table 4.5-4). These increases would constitute approximately 91 percent of the total increase in enrollments of 1,626 by the year 2013, bringing the total student population to 3,161.

The number of teachers associated with the increased enrollments would be 47 by 1998 and 79 by 2013 in order to maintain the 1990 student-teacher

**Table 4.5-4. Proposed Action: Enrollment and Teaching Staff Effects**

	1998	2003	2013
<b>Student Enrollment Effects</b>			
Oscoda Area Schools	887	1,101	1,484
Tawas Area Schools	85	106	142
Total	972	1,207	1,626
<b>Teaching Staff Effects</b>			
Oscoda Area Schools	47	59	79
Tawas Area Schools	4	5	7
Total	51	64	86

Note: Effects of migratory-related population changes on student enrollments and teaching staff requirements.

ratio, which would increase teaching staff levels by the year 2013 by about 84 percent of the 1993 (closure baseline) level of 88 teachers.

**Tawas Area Schools.** Student enrollments in the Tawas Area Schools are projected to increase by 85 in 1998, 106 by 2003, and 142 in 2013 (see Table 4.5-4), representing 9.6 percent of the total increase in enrollments in the ROI by 2013 due to population in-migration. By 2013, student enrollments would represent an 8.4 percent increase over 1993 (closure baseline) enrollments of 1,696 in the Tawas Area Schools.

Associated increases in teaching staff in the Tawas Area Schools would be four by 1998 and seven by 2013 in order to maintain the 1990 student-teacher ratio, an increase of 9 percent by 2013 over the 1993 (closure baseline) level of 84 teachers.

#### **4.5.2.2 Fire Training Alternative**

**Oscoda Area Schools.** Student enrollments under the Fire Training Alternative in the Oscoda Area Schools are projected to increase by 384 in 1998, 584 in 2003, and 848 in 2013 (Table 4.5-5). These enrollment increases would constitute more than 91 percent of the total increase in enrollments of 928 students within the ROI by the year 2013 due to population in-migration. The potential 848 students added to the district enrollments by 2013 would represent a 51-percent increase over 1,677 students in Oscoda Area Schools in 1993 (closure baseline), bringing the total district enrollment to 2,525.

In order to maintain the 1990 student-teacher ratio, associated increases in teaching staff would be 21 by 1998 and 45 by 2013, an increase of 51 percent by 2013 over the 1993 (closure baseline) level of 88 teachers.

**Table 4.5-5. Fire Training Alternative: Enrollment and Teaching Staff Effects**

	1998	2003	2013
<b>Student Enrollment Effects</b>			
Oscoda Area Schools	384	584	848
Tawas Area Schools	36	55	80
Total	420	639	928
<b>Teaching Staff Effects</b>			
Oscoda Area Schools	21	31	45
Tawas Area Schools	2	3	4
Total	23	34	49

**Note:** Effects of migratory-related population changes on student enrollments and teaching staff requirements.

**Tawas Area Schools.** Student enrollments in the Tawas Area Schools are projected to increase by 36 in 1998, 55 by 2003, and 80 in 2013 (see Table 4.5-5). These increases would constitute approximately 5 percent of the total student enrollment effects by 2013 creating a total enrollment of 1,776.

In order to maintain the 1990 student-teacher ratio, associated increases in teaching staff in the Tawas Area Schools would be two by 1998, and four by 2013, which would increase teaching staff by about 5 percent by 2013 under this alternative over 1993 (closure baseline).

#### **4.5.2.3 Recreation Alternative**

**Oscoda Area Schools.** Student enrollments in the Oscoda Area Schools are projected to increase by 175 in 1998, 310 in 2003, and 506 in 2013 (Table 4.5-6). This would create a total enrollment in 2013 of 2,183 students, an increase of 30 percent.

In order to maintain the 1992 student-teacher ratio, associated increases in teaching staff would be 10 teachers by 1998 and 27 by 2013, which would increase teaching staff levels by 30 percent over 1993 (closure baseline).

**Tawas Area Schools.** Increased student enrollments in the Tawas Area Schools are projected to be 16 in 1998, 29 by 2003, and 48 in 2013 (see Table 4.5-6). This increase would constitute approximately 8 percent by 2013 due to population in-migration.

In order to maintain the 1990 student-teacher ratio, associated increases in teaching staff in the Tawas Area Schools would be one by 1998 and two by 2013, which would increase teaching staff levels under the Recreation



**Table 4.5-6. Recreation Alternative: Enrollment and Teaching Staff Effects**

	1998	2003	2013
<b>Student Enrollment Effects</b>			
Oscoda Area Schools	175	310	506
Tawas Area Schools	16	29	48
Total	191	339	554
<b>Teaching Staff Effects</b>			
Oscoda Area Schools	10	17	27
Tawas Area Schools	1	1	2
Total	11	18	29

Note: Effects of migratory-related population changes on student enrollments and teaching staff requirements.

Alternative by about 2.8 percent by 2013 from the 1993 (closure baseline) level.

#### **4.5.2.4 No-Action Alternative**

Public education effects of the No-Action Alternative are the same as those described in Section 3.5.2 as closure conditions and highlighted in the introduction to Section 4.5.2.

#### **4.5.3 Police Protection**

Under each alternative, potential effects to police protection services are examined based on reuse-related population, increase in land area covered, types of services to be provided, and infrastructure. Because of the magnitude of some effects of closure and reuse, level-of-service ratios may not adequately meet new service requirements.

**Area-Generated Police Demands.** The project site is within Oscoda Township, and police protection of the area would become the responsibility of the Oscoda Township Police Department upon reuse. With this increased area of responsibility, further officer staffing by the department would be required, in addition to those needed for increases in per-capita demand. Based on a 1992 level-of-service ratio of 1,629 acres per sworn officer, the additional sworn officers that may be required to serve the site are described for the Proposed Action and each alternative.

Under closure baseline conditions with the base in caretaker status (No-Action Alternative), the fenced site would be patrolled by an OL contractor. Law enforcement support would be provided primarily by the Oscoda Township Police Department, requiring no additional officers.

#### 4.5.3.1 Proposed Action

**Oscoda Township Police Department.** The Oscoda Township Police Department would experience the greatest increase in demand for staffing under the Proposed Action. Projected in-migrating population increases in Oscoda and Au Sable would require staffing levels to increase by three sworn officers in 1998 and five sworn officers in 2013 (Table 4.5-7). This would retain the 1992 service levels of 1.2 sworn officers per 1,000 persons. This increase in police officers would represent 63 percent by 2013 over 1993 (closure baseline) levels of 8 officers.

**Table 4.5-7. Proposed Action: Police Protection Effects**

	1998	2003	2013
Oscoda Township Police Dept. (includes Au Sable Township contract)	3	4	5
Alcona County Sheriff (services to Greenbush Township only)	1	1	1
<b>Total</b>	<b>4</b>	<b>5</b>	<b>6</b>

Note: Effects of migratory-related population changes on number of sworn officers required.  
Does not include area-generated demand.

Based on the 1992 area-generated level-of-service ratio, the Oscoda Township Police Department could require up to three officers, in addition to the per-capita increases, to serve the additional 4,626 serviceable acres created by development under the Proposed Action. New mutual aid agreements between federal, state, and county law enforcement agencies and the Oscoda Police with regard to the site would have to be negotiated in accordance with their existing agreements. No other mutual aid agreements would be affected by reuse of the site.

**Alcona County Sheriff.** Although the Alcona County Sheriff's Department is projected to require three additional sworn officers in 1998 and five sworn officers by 2013 to meet the additional service demand created by population in-migration associated with the Proposed Action, only one additional officer is for Greenbush Township (see Table 4.5-7). This increase would maintain the 1992 level of service of 1.8 officers per 1,000 persons. This total demand of five officers would increase by 45 percent over 1993 (closure baseline) levels of 11 officers by 2013. The number of officers serving Greenbush Township would double over the same period. The existing mutual aid agreements would not be affected.

#### 4.5.3.2 Fire Training Alternative

**Oscoda Township Police Department.** The Oscoda Township Police Department staffing levels associated with the development of the Fire Training Alternative are projected to increase by one sworn officer in 1998 and three sworn officers by 2013 (Table 4.5-8). These increases in police officers would maintain the 1992 service level of 1.2 sworn officers per 1,000 persons and meet increased demand for police protection in Oscoda and Au Sable townships. The additional officers would increase by 38 percent over the 1993 (closure baseline) level of 8 police officers by 2013.

**Table 4.5-8. Fire Training Alternative: Police Protection Effects**

	1998	2003	2013
Oscoda Township Police Dept. (includes Au Sable Township contract)	1	2	3
Alcona County Sheriff (services to Greenbush Township only)	0	1	1
<b>Total</b>	<b>1</b>	<b>3</b>	<b>4</b>

**Note:** Effects of migratory-related population changes on number of sworn officers required.  
Does not include area-generated demand.

Two additional sworn officers would be required to serve the additional 3,505 serviceable acres created by development under this alternative, based on the 1992 service area per sworn officer level for the township (1,629 acres per officer). New mutual aid agreements regarding the site may have to be negotiated.

**Alcona County Sheriff.** The Alcona County Sheriff's Department is projected to require one additional sworn officer in 2003 to meet the additional service demand associated with the development of the Fire Training Alternative. Of the total number of additional officers, Greenbush Township would require one to meet the increased demand for services in the township from 1998 to 2013, with the other two officers serving the rest of the county (see Table 4.5-8). This would increase total staffing by 27 percent over 1993 (closure baseline) levels of 11 officers in 2013, and double the number of officers in Greenbush Township.

#### 4.5.3.3 Recreation Alternative

**Oscoda Township Police Department.** The Oscoda Township Police Department staffing levels associated with the development of the Recreation Alternative are projected to be one sworn officer in 1998,

increasing to two by 2013 (Table 4.5-9), in order to maintain the 1992 level of 1.2 sworn officers per 1,000 persons. These additional police officers would increase the total staffing to ten, a 25 percent increase by 2013 over 1993 (closure baseline) levels.

**Table 4.5-9. Recreation Alternative: Police Protection Effects**

	1998	2003	2013
Oscoda Township Police Dept. (includes Au Sable Township contract)	1	1	2
Alcona County Sheriff (services to Greenbush Township only)	0	0	1
<b>Total</b>	<b>1</b>	<b>1</b>	<b>3</b>

Note: Effects of migratory-related population changes on number of sworn officers required.  
Does not include area-generated demand.

Three additional sworn officers would be required to serve the additional 4,529 serviceable acres created by development under this alternative, based on the 1992 service area (1,629 acres) per sworn officer for the township. New mutual aid agreements would have to be negotiated with regard to this new service area.

**Alcona County Sheriff.** The Alcona County Sheriff's Department is projected to require one additional sworn officer by 2013 to meet the additional service demand associated with the Recreation Alternative. Greenbush would require one additional officer to meet increased demand for services in the township (see Table 4.5-9). While the additional officers would increase total staff levels by about 18 percent for the county as a whole, police protection demands in Greenbush would double from 1993 (closure baseline) conditions.

#### **4.5.3.4 No-Action Alternative**

Police protection effects of the No-Action Alternative are the same as those described in Section 3.5 as closure conditions and highlighted in the introduction to Section 4.5.3.

#### **4.5.4 Fire Protection**

Under each alternative, potential effects to fire protection services are examined. The analysis considers reuse-related population, service areas, and infrastructure responsibility changes.

With Wurtsmith AFB closed and in caretaker status (No-Action Alternative), an OL fire protection team would operate at the site using the base fire fighting equipment. It is assumed that mutual aid supplemental fire protection support would be provided primarily by the Oscoda Township Fire Department, and additional fire fighters would not be required.

**Area-Generated Fire Fighters.** If Wurtsmith AFB property is conveyed under the Proposed Action or one of the reuse alternatives, responsibility for fire protection of the entire site would be assumed by the Oscoda Township Fire Department. In order to serve the land area consisting of 4,626 acres and associated infrastructure, the department would require two additional fire fighters, in addition to those required for increases in per-capita demand for each of the reuse alternatives, based on the 1992 level-of-service ratios of 2,624 acres per fire fighter. In addition, depending on the types of buildings (e.g., multi-story structures) and land use (e.g., aviation uses) that would be constructed and operated under the Proposed Action or reuse alternatives, new fire fighting and/or emergency response equipment may be needed to provide adequate fire protection to the site. It is assumed that existing mutual aid agreements would have to be renegotiated with regard to the site itself, but that otherwise these agreements would not be affected by reuse of the site.

#### 4.5.4.1 Proposed Action

**Oscoda Township Fire Department.** On a per-capita basis, the Oscoda Township Fire Department is projected to require 9 additional volunteer fire fighters by 1998 and 14 by 2013 to meet the additional demand created by the Proposed Action and still retain the 1992 level of service of 3.3 fire fighters per 1,000 persons (Table 4.5-10). The additional 14 fire fighters would increase the number of volunteers by 67 percent by 2013 over 1993 (closure baseline) levels of 21 fire fighters. In addition, the aviation uses proposed under the Proposed Action may require special fire fighting equipment, additional training, and/or a new fire station closer to the site to provide fire protection services to the site.

**Table 4.5-10. Proposed Action: Fire Protection Effects**

	1998	2003	2013
Oscoda Township Fire Dept. (includes Au Sable Township)	9	11	14
Greenbush Township Volunteer Fire Dept.	6	7	10
<b>Total</b>	<b>15</b>	<b>18</b>	<b>24</b>

**Note:** Effects of migratory-related population changes on number of fire fighters required.  
Does not include area-generated demand.

**Greenbush Volunteer Fire Department.** Under the Proposed Action, the Greenbush Volunteer Fire Department is projected to require six additional volunteer fire fighters by 1998 and ten by 2013 to meet increased demand in Greenbush while maintaining the department's 1992 level of service of 11.7 fire fighters per 1,000 persons. These additional fire fighters would represent an increase of 83 percent over 1993 (closure baseline) levels of 12 fire fighters.

#### **4.5.4.2 Fire Training Alternative**

**Oscoda Township Fire Department.** Under the Fire Training Alternative, the Oscoda Township Fire Department is projected to require four additional volunteer fire fighters by 1998 and eight by 2013 (Table 4.5-11) to maintain the 1992 level of service of 3.3 fire fighters per 1,000 persons. In comparison to the 1993 (closure baseline) levels of 21 fire fighters, this alternative would increase the number of fire fighters by 38 percent by 2013.

**Table 4.5-11. Fire Training Alternative: Fire Protection Effects**

	1998	2003	2013
Oscoda Township Fire Dept. (includes Au Sable Township)	4	6	8
Greenbush Township Volunteer Fire Dept.	3	4	5
<b>Total</b>	<b>7</b>	<b>10</b>	<b>13</b>

**Note:** Effects of migratory-related population changes on number of fire fighters required. Does not include area-generated demand.

**Greenbush Volunteer Fire Department.** Under the Fire Training Alternative, the Greenbush Volunteer Fire Department is projected to need three additional volunteer fire fighters by 1998 and five by 2013 to serve the increased demand created by this alternative while maintaining the township's 1992 level of service of 11.7 fire fighters per 1,000 persons. These additional fire fighters would represent an increase of 42 percent over 1993 (closure baseline) levels of 12 fire fighters.

#### **4.5.4.3 Recreation Alternative**

**Oscoda Township Fire Department.** Under the Recreation Alternative, the Oscoda Township Fire Department would need two additional volunteer fire fighters by 1998 and five by 2013 (Table 4.5-12) to meet the related increases in demand for fire protection, while maintaining the department's 1992 level of service of 3.3 fire fighters per 1,000 persons. This would

**Table 4.5-12. Recreation Alternative: Fire Protection Effects**

	1998	2003	2013
Oscoda Township Fire Dept. (includes Au Sable Township)	2	3	5
Greenbush Township Volunteer Fire Dept.	1	2	3
Total	3	5	8

Note: Effects of migratory-related population changes on number of fire fighters required.  
Does not include area-generated effects.

represent a 24-percent increase by 2013 over 1993 (closure baseline) levels.

**Greenbush Volunteer Fire Department.** Under the Recreation Alternative, the Greenbush Volunteer Fire Department would need one additional volunteer fire fighter by 1998, and three by 2013 to meet increased demand for fire protection and retain the 1992 level of service of 11.7 fire fighters per 1,000 persons. The additional three fire fighters by 2013 would increase staffing levels by 25 percent over 1993 (closure baseline) levels.

**4.5.4.4 No-Action Alternative.** Fire protection effects of the No-Action Alternative are the same as those described in Section 3.5.4 for closure conditions and as highlighted at the beginning of Section 4.5.4.

#### **4.5.5 Health Care**

With Wurtsmith AFB closed and in caretaker status (the No-Action Alternative), the base hospital would be closed, and the Air Force would no longer provide medical services to retired military personnel and their dependents or dependents of deceased military personnel. Since the next closest Air Force installation with a medical facility is more than 300 miles away (K.I. Sawyer AFB or Wright-Patterson AFB), the region's nearly 3,422 military retirees and their dependents would rely on the 26 community health service facilities in the ROI and the CHAMPUS program for medical and health care services. Retirees can also receive prescriptions by mail through an Air Force program based at Wright-Patterson AFB. Following closure, veterans residing in the ROI would have access to the VA hospital in Saginaw (90 miles south), and a medical clinic in Gaylord (50 miles northwest) for benefit services. These are the closure conditions to which each of the reuse alternatives is compared.

**4.5.5.1 Proposed Action.** Under the Proposed Action, medical facilities could include various combinations of limited outpatient care (pharmacy, urgent care, medical/dental clinics, etc.). Thus, convenient health services

may be available for military retirees and their dependents. The community health care services at closure plus potential new facilities at the site should sufficiently meet the health care needs of the region including the in-migrating population.

**4.5.5.2 Fire Training Alternative.** Health care effects from implementation of the Fire Training Alternative would be the same as the Proposed Action.

**4.5.5.3 Recreation Alternative.** Health care effects from implementation of the Recreation Alternative would be the same as the Proposed Action.

**4.5.5.4 No-Action Alternative.** Health care effects of the No-Action Alternative would be those described in Section 3.5.5 as closure conditions, and as highlighted in the introduction to Section 4.5.5.

## **4.6 PUBLIC FINANCE**

Fiscal effects to potentially affected jurisdictions are presented in this section. The results represent the net effects of reuse after accounting for the out-migration of the direct and indirect military and civilian jobs associated with phasing out the Wurtsmith AFB military mission.

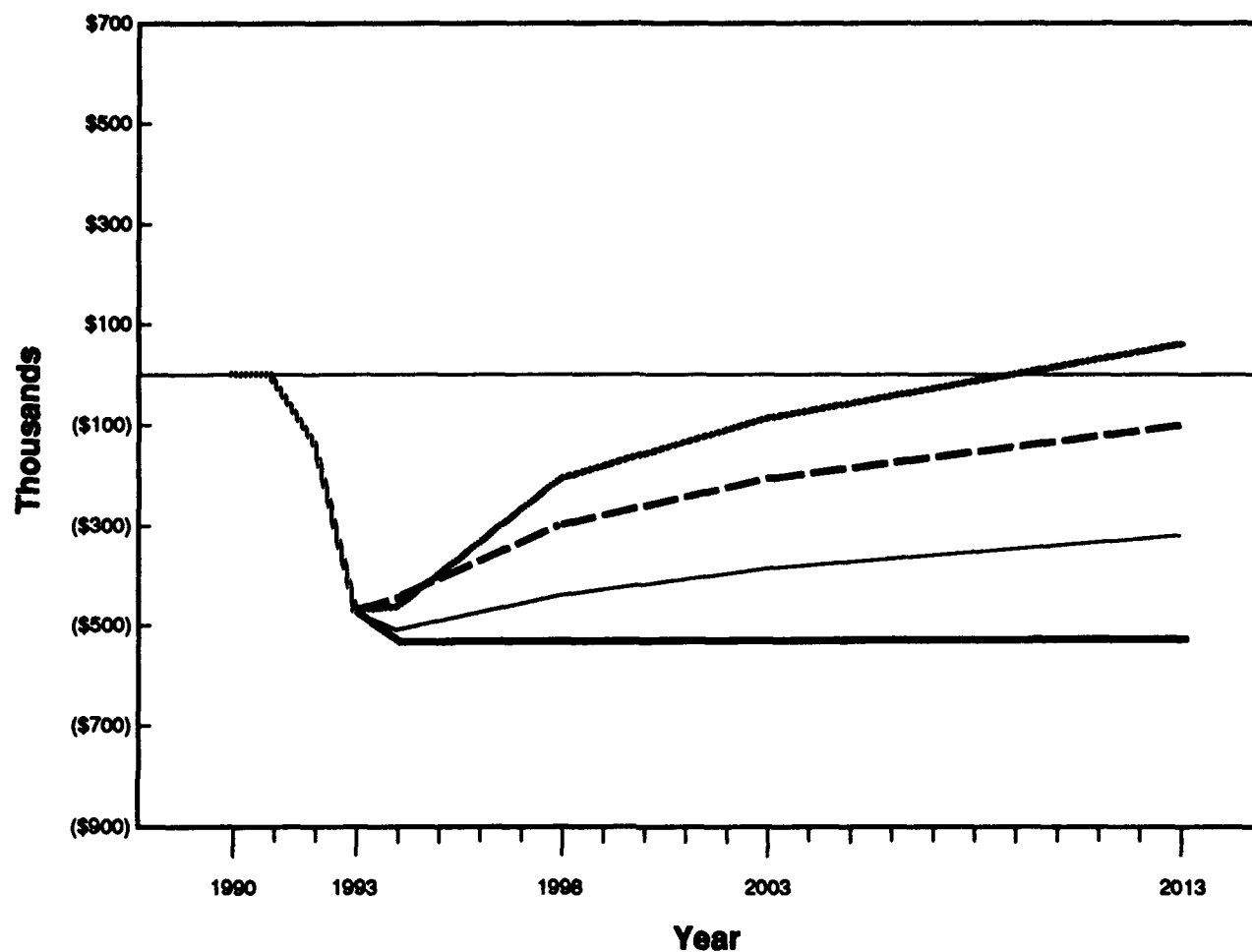
Figures 4.6-1 through 4.6-7 present the net fiscal effects to each jurisdiction for each proposed alternative reuse plan, compared to projected fiscal conditions resulting from closure.

**Assumptions.** Conversion of portions of the base to private ownership or use would directly affect property tax revenues in the jurisdictions within which the base is located (i.e., Iosco County, the township of Oscoda, and the Oscoda Area Schools). Indirect property tax effects may be experienced in other jurisdictions due to the effects on the local tax base of population in-migration over and above the expected population out-migration due to closure and these effects are noted.

Most of the base land would probably revert to the state of Michigan dependent upon disposal and reuse decisions. The disposal and reuse process is explained in Chapter 1 of the *EIS for Disposal and Reuse of Wurtsmith AFB, Michigan*, including a discussion regarding conveyance or transfer of federal property.

One financing method for the purchase of the base facilities and infrastructure, as well as financing for improvements for reuse, could be the declaration of the base as a redevelopment area. Special state legislation is being considered to make this method available to the Wurtsmith AFB area. If the new legislation passes, purchase of existing improvements and development of additional improvements as required could be financed by the issuance of bonds. These bonds would be repaid by the expected



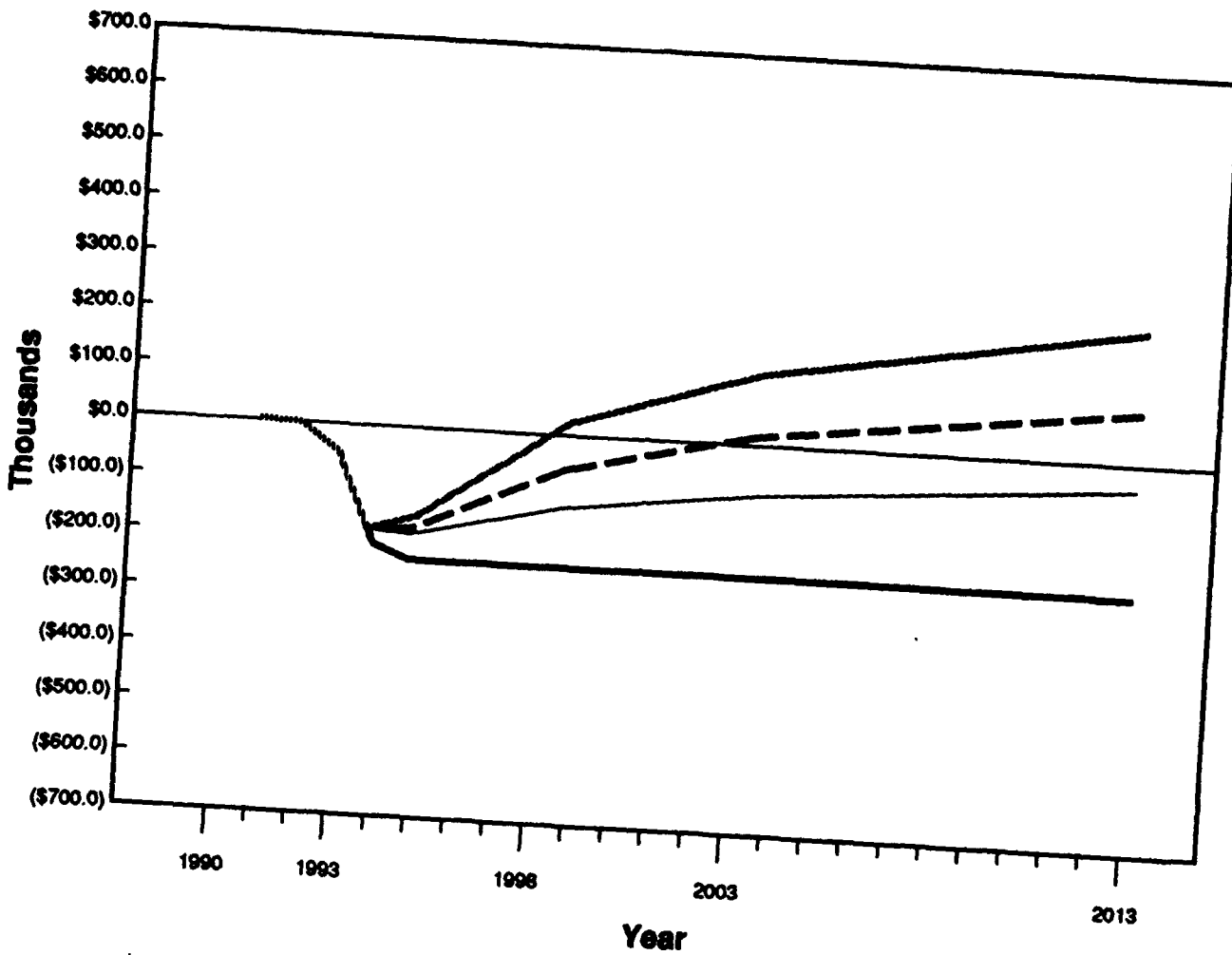


#### EXPLANATION

- ..... Preclosure
- Proposed Action
- Fire Training Alternative
- Recreation Alternative
- No-Action/Post-Closure

**County of Losco,  
Net Fiscal Projections,  
Proposed Action and  
Alternatives  
(1989\$)**

**Figure 4.6-1**

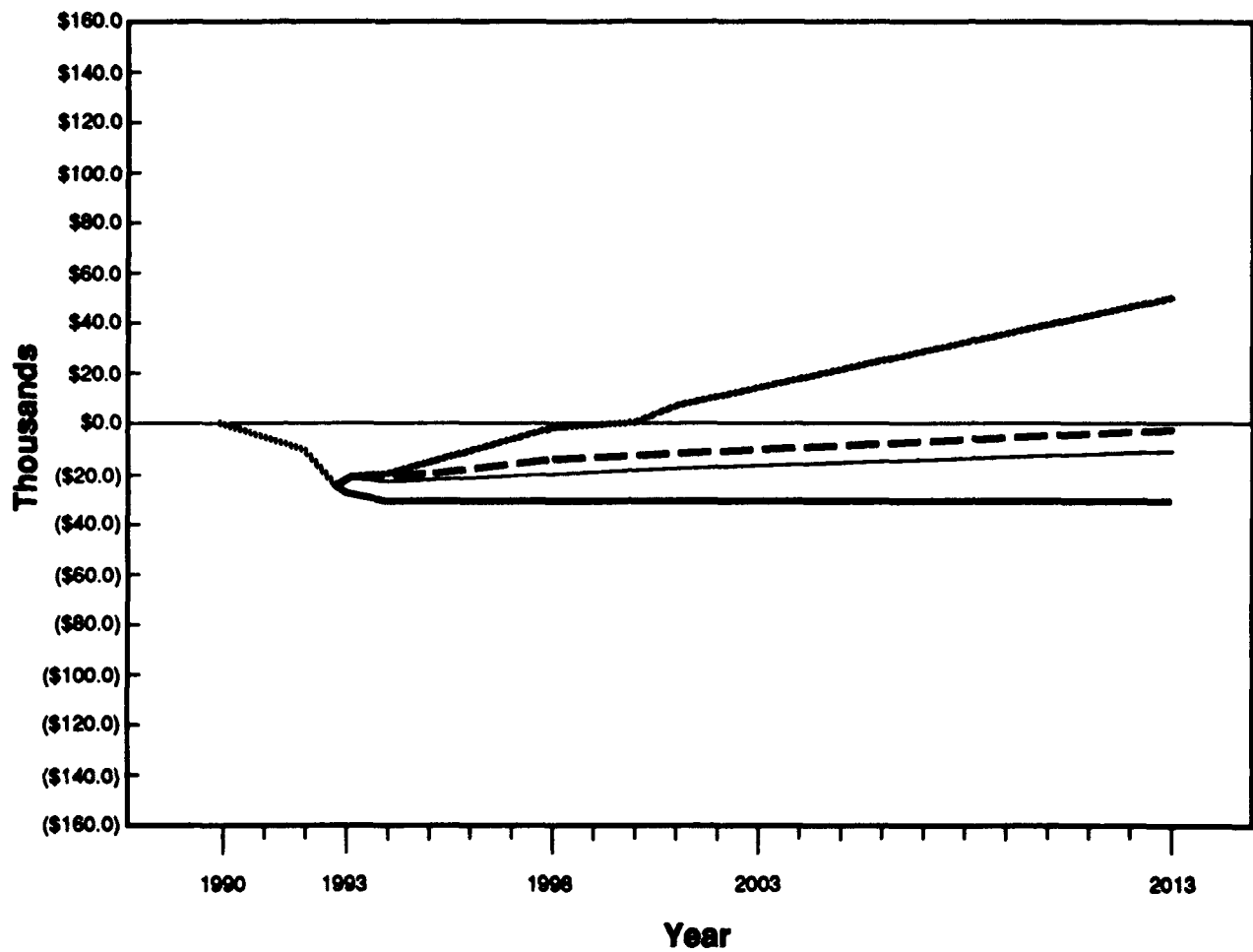


**EXPLANATION**

- ..... Preclosure
- Proposed Action
- - - - Fire Training Alternative
- Recreation Alternative
- No-Action/Post-Closure

**Township of Oscoda,  
Net Fiscal Projections,  
Proposed Action and  
Alternatives  
(1989\$)**

**Figure 4.6-2**

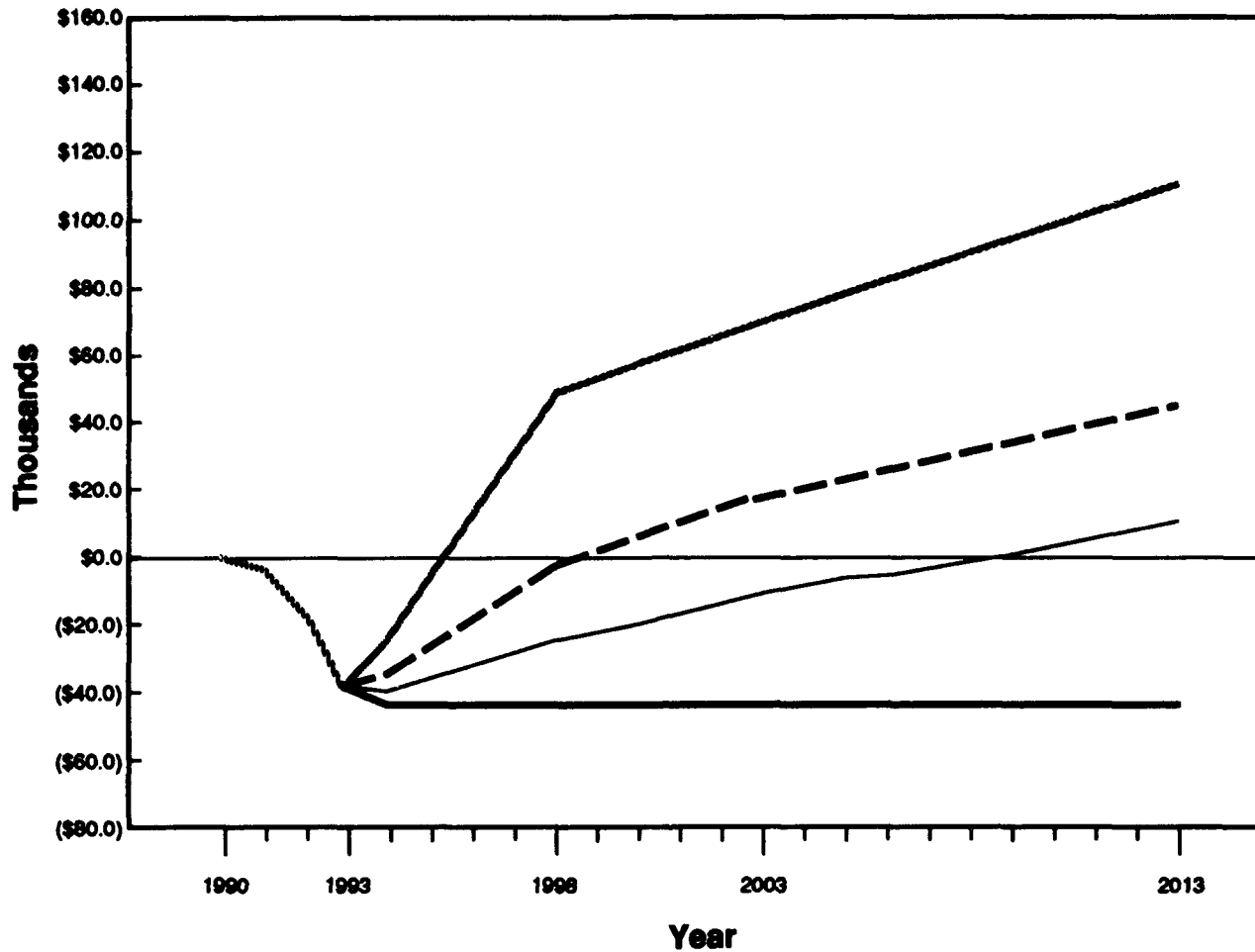


#### EXPLANATION

- ..... Preclosure
- Proposed Action
- - - - Fire Training Alternative
- Recreation Alternative
- No-Action/Post-Closure

**Township of Au Sable,  
Net Fiscal Projections,  
Proposed Action and  
Alternatives  
(1989\$)**

**Figure 4.6-3**

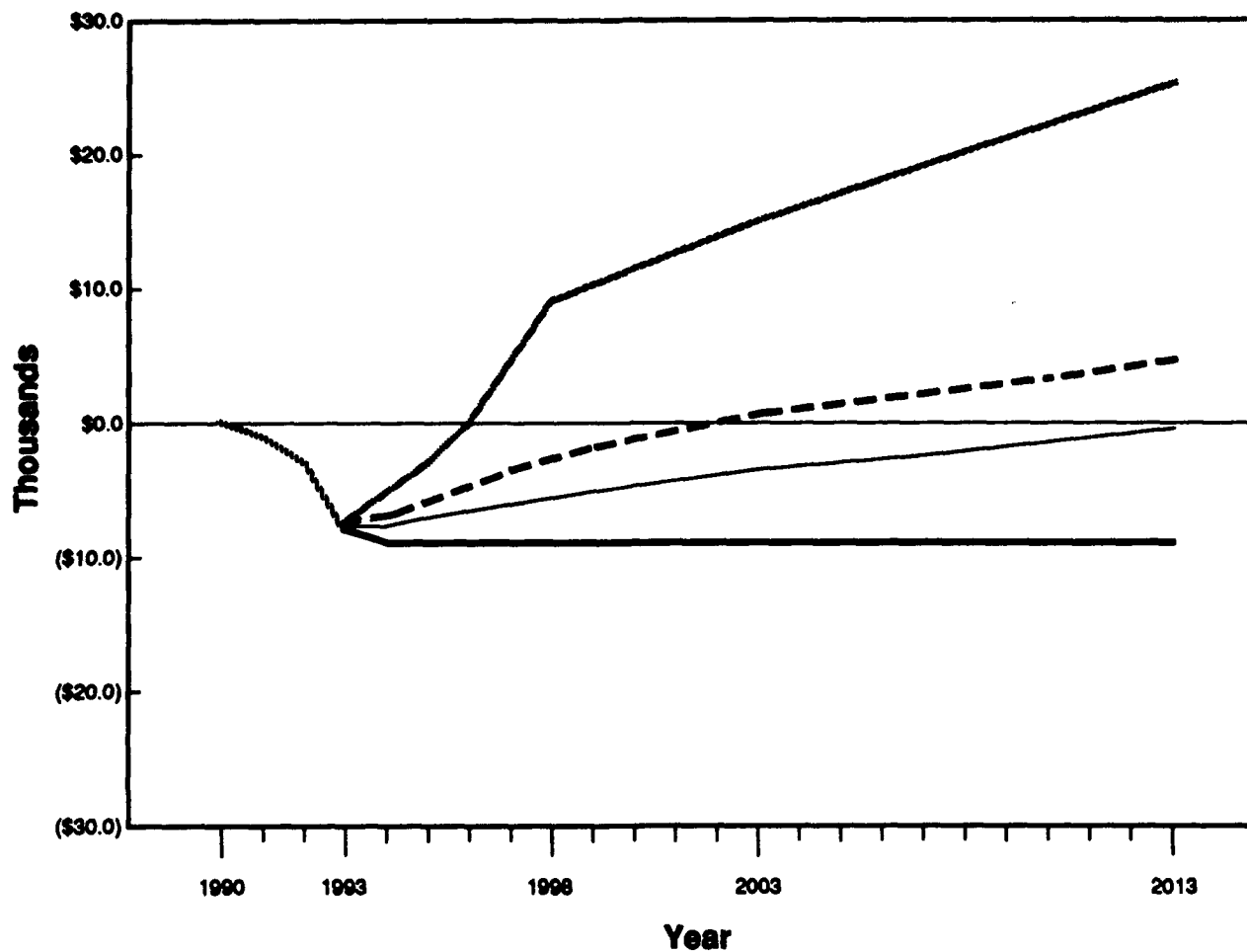


#### EXPLANATION

- ..... Preclosure
- Proposed Action
- - - - Fire Training Alternative
- Recreation Alternative
- No-Action/Post-Closure

**County of Alcona,  
Net Fiscal Projections,  
Proposed Action and  
Alternatives  
(1989\$)**

**Figure 4.6-4**

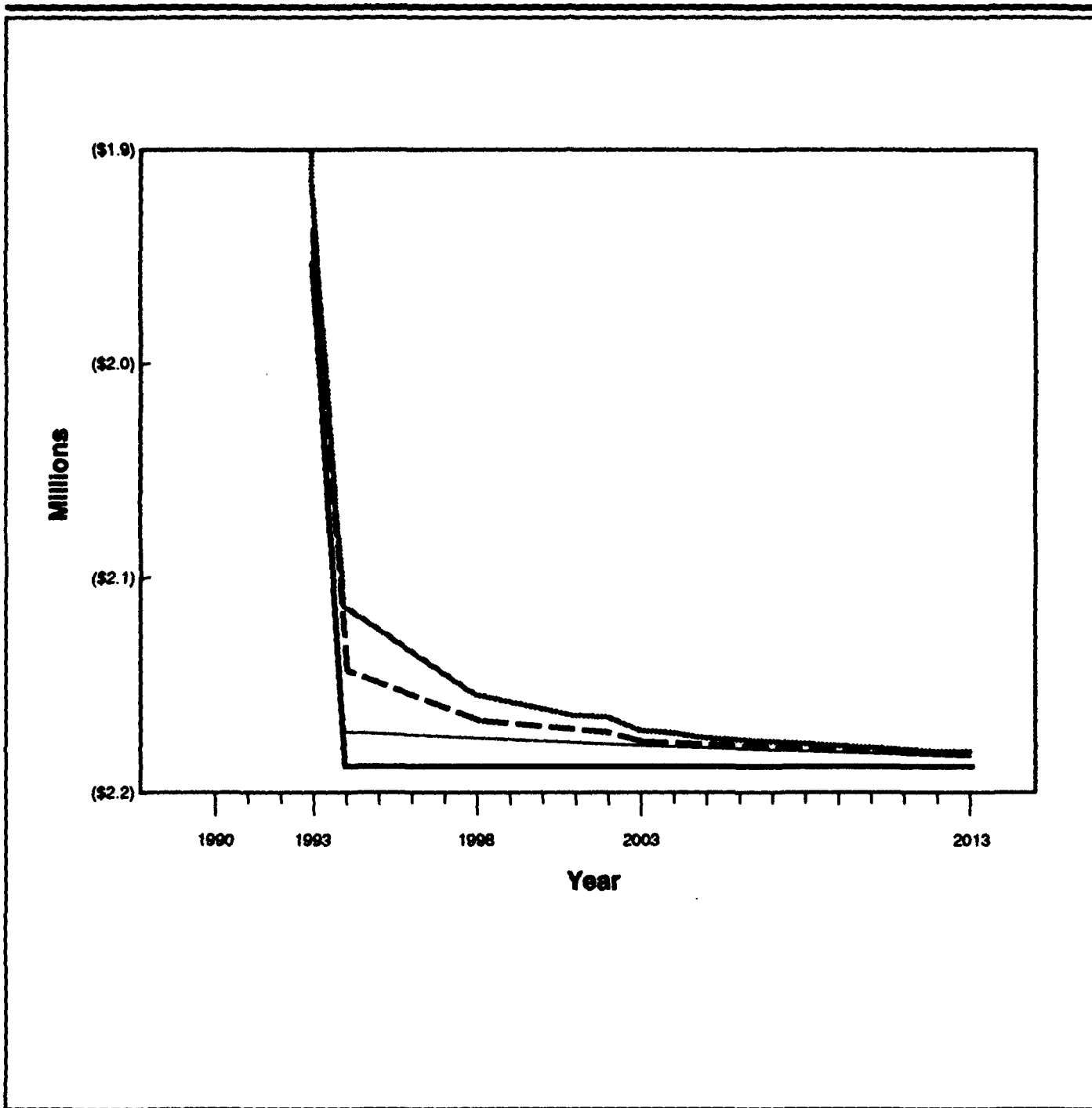


#### EXPLANATION

- ..... Preclosure
- Proposed Action
- Fire Training Alternative
- Recreation Alternative
- No-Action/Post-Closure

**Township of  
Greenbush,  
Net Fiscal Projections,  
Proposed Action and  
Alternatives  
(1989\$)**

**Figure 4.6-5**



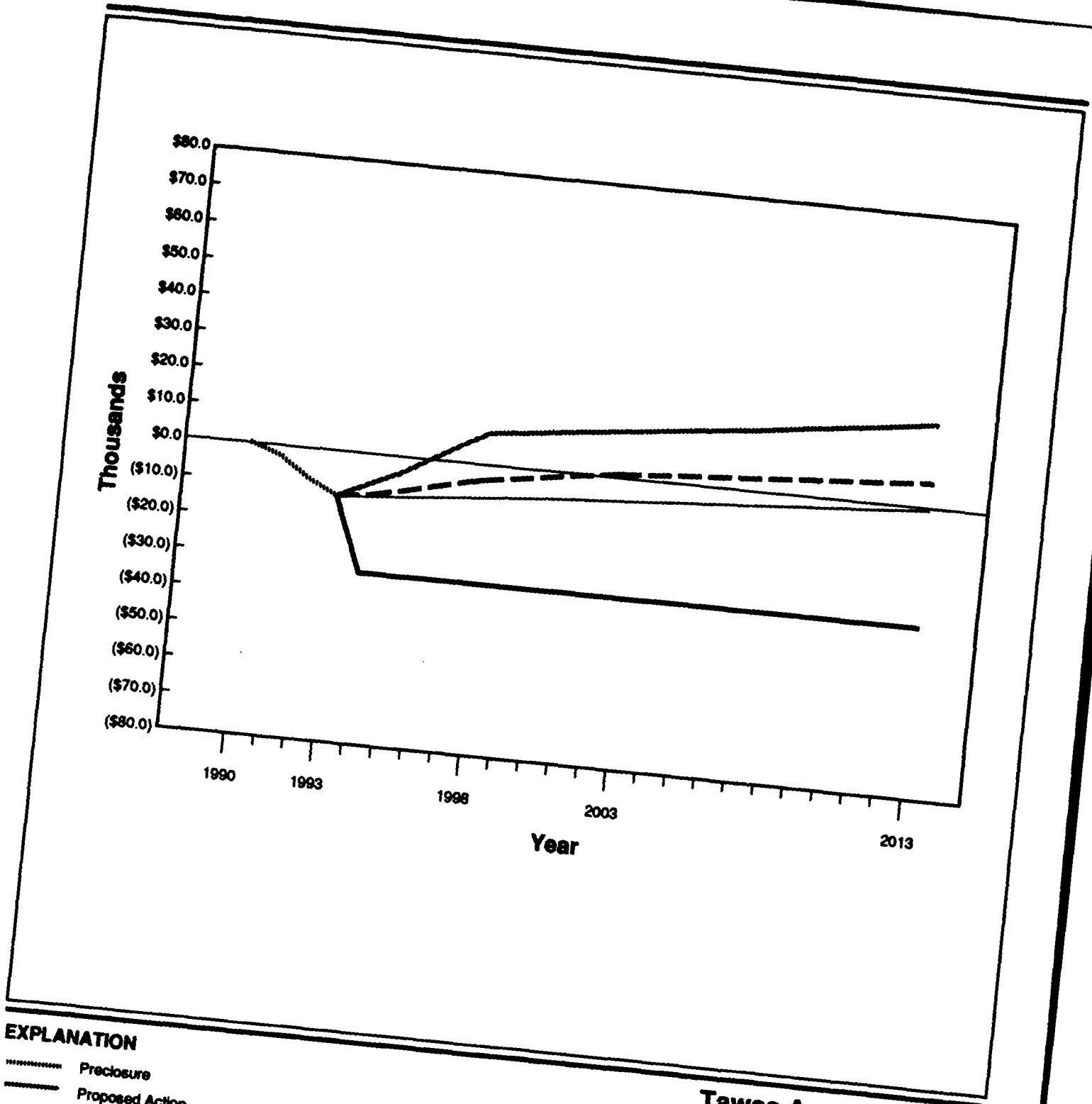
#### EXPLANATION

- ..... Preclosure
- Proposed Action
- - - - - Fire Training Alternative
- Recreation Alternative
- No-Action/Post-Closure

**Oscoda Area Schools,  
Net Fiscal Projections,  
Proposed Action and  
Alternatives  
(1989\$)**

**Note:** Fiscal projections for the Proposed Action and three alternatives, for 1994 to 2013, are approximately -\$2.2 million.

**Figure 4.6-6**



#### EXPLANATION

- ..... Preclosure
- Proposed Action
- Fire Training Alternative
- Recreation Alternative
- No-Action/Post-Closure

**Tawas Area Schools,  
Net Fiscal Projections,  
Proposed Action and  
Alternatives  
(1989\$)**

**Figure 4.6-7**

*Wurtsmith AFB Disposal and Reuse SIAS*

incremental increase in taxes on privately owned property from the expected rise in valuations due to the improvements made by the redevelopment agency in the area.

For purposes of this analysis, financing for the purchase of property and for the development of improvements as required is assumed to be direct grants-in-aid from existing state and federal grant programs, revenue bonds, existing reserves, and/or other in-place aid programs.

#### **4.6.1 Proposed Action**

Key assumptions regarding future jurisdictional control of base property, which influence the fiscal assessments, are presented below:

- Aviation support land use areas would be conveyed or leased to an airport authority or another public agency and thus are not subject to local property taxes.
- The industrial and commercial land use initially would remain in public ownership but would subsequently be leased or sold to private interests and be subject to local property taxes.
- The institutional use area is assumed to remain in public ownership or be conveyed or leased to other public agencies and thus would not be subject to local property taxes.
- All of the residential land use areas would be sold in the private market and would be subject to local property taxes.
- All areas designated for public and recreation uses would remain in public ownership or be leased to other public agencies and, therefore, would not be subject to local property taxes.

**4.6.1.1 County of Losco.** Fiscal effects of the Proposed Action on Losco County indicate an improvement over the 1993 post-closure scenario through FY 2013.

**Revenues.** Increased revenues to the general and special revenue funds would come from several sources. Property taxes would increase from conversion of a portion of the base to private use. Charges for services would increase as direct and secondary jobs attract in-migrants to the area. State-shared revenue would increase with population. Revenue gains are projected to be \$510,850 by FY 1998 and \$898,473 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in county residents are estimated to require \$183,674 in increased



expenditures in FY 1998 and \$306,319 by FY 2013. Projected positive net fiscal effects would be \$327,176 by FY 1998 and \$592,154 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$529,469 (see Section 3.6) in the early years of reuse. The county would be faced with gradually declining deficits from closure through FY 2008. These deficits would require some response by the county, such as service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 2009, the positive fiscal effects of the Proposed Action would offset projected deficits due to base closure.

**4.6.1.2 Township of Oscoda.** Fiscal effects of the Proposed Action on the Township of Oscoda indicate an improvement over the post-closure scenario through FY 2013.

**Revenues.** Increased general and special revenue fund revenues would come principally from increased property taxes (from conversion of a portion of the base to private use), state-shared revenue (sales taxes and other state-shared revenue), and charges for services. These revenue gains are projected to be \$332,577 by FY 1998 and \$593,895 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in township residents are estimated to require \$71,273 in increased expenditures by FY 1998 and \$118,864 by FY 2013. Projected positive net fiscal effects would be \$261,304 in FY 1998 and \$475,031 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$238,702 (see Section 3.6) in the early years of reuse. The township would be faced with gradually declining deficits from closure through FY 1997. These shortfalls would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, or development of new revenue sources. By FY 1998, the positive fiscal effects of the Proposed Action would offset projected deficits due to base closure.

**4.6.1.3 Township of Au Sable.** Fiscal effects of the Proposed Action on Au Sable would show an improvement over the post-closure scenario through FY 2013.

**Revenues.** Increased general and special revenue fund revenues would come principally from increased property taxes (due to the additional housing demand associated with population in-migration under reuse, which would be greater than population out-migration projected under the closure scenario), charges for services, and licenses and permits. Revenue gains are projected to be \$61,742 in FY 1998 and \$135,729 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in township residents are estimated to require about \$32,834 in increased expenditures in FY 1998 and \$54,770 by FY 2013. Projected positive net fiscal effects would be \$28,908 in FY 1998 and \$80,959 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$30,207 (see Section 3.6) in the early years of reuse. The township would be faced with gradually declining deficits from closure through FY 1999. These shortfalls would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 2000, the positive fiscal effects of the Proposed Action would offset projected deficits due to base closure.

**4.6.1.4 County of Alcona.** Fiscal effects of the Proposed Action on Alcona County indicate an improvement compared to the post-closure scenario through FY 2013.

**Revenues.** Increased general and special revenue fund revenues would come principally from increased property taxes (due to the additional housing demand associated with greater population in-migration under reuse compared to out-migration due to closure), charges for services, and state and federal intergovernmental transfers. These revenue gains are projected to be \$244,091 in FY 1998 and \$407,021 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in county residents are estimated to require about \$151,240 in increased expenditures by FY 1998 and \$252,191 by FY 2013. Projected positive net fiscal effects would be \$92,851 in FY 1998 and \$154,830 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$44,787 (see Section 3.6) in the early years of reuse. The county would be faced with gradually declining deficits through FY 1995. These shortfalls would require some response by the county through service cutbacks and/or increases in tax and non-tax revenue schedules. By FY 1996, the positive fiscal effects of the Proposed Action would have offset projected deficits due to base closure.

**4.6.1.5 Township of Greenbush.** Fiscal effects of the Proposed Action on Greenbush indicate an improvement compared to the post-closure scenario through FY 2013.

**Revenues.** Increased general and special revenue fund revenues would come principally from increased property taxes (due to the additional housing demand associated with greater population in-migration under reuse

compared to population out-migration due to closure) and state-shared revenue (sales taxes). These revenue gains are projected to be \$32,219 in FY 1998 and \$57,628 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in township residents are estimated to require \$14,015 in increased expenditures by FY 1998 and \$23,377 by FY 2013. Projected positive net fiscal effects would be \$18,204 in FY 1998 and \$34,251 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$9,055 (see Section 3.6) in the early years of reuse. The township would be faced with gradually declining deficits through FY 1996. These shortfalls would require some response by the township through service cutbacks and/or increases in tax and non-tax revenue schedules. By FY 1997, the positive fiscal effects of the Proposed Action would offset projected deficits due to base closure.

#### **4.6.1.6 Oscoda Area Schools**

**Revenues.** Total general and special revenue fund increases due to the additional students under the Proposed Action are projected to be approximately \$2.4 million in FY 1998 and \$4.1 million by FY 2013. District funding is principally from property taxes and state aid revenues. Funding from these sources is limited to approximately \$2,880 per student (in constant 1989 dollars). Based on an increase in the state equalized (assessed) valuation in the district of \$46.7 million by 2013 and an FY 1992 property tax rate of 26.1199 mills (dollars per \$1,000 of assessed valuation), property tax revenues would amount to about \$609,383 by FY 1998 and \$1.2 million by 2013. The remainder of the total general and special revenue fund revenue increases would be principally from state aid programs.

**Expenditures and Net Fiscal Effects.** Expenditure increases, principally from increased direct instruction costs would increase by approximately \$2.4 million by FY 1998 and \$4.1 million by FY 2013. These expenditure increases would offset projected revenue increases, and no positive net fiscal effects from the Proposed Action are expected.

**Comparison to Closure Conditions.** The fiscal effects of the Proposed Action would not be sufficient to offset projected closure deficits. In both the short and long term, revenue shortfalls would be approximately \$2.2 million, due primarily to the loss of P.L. 81-874 funds, which would not be replaced with state source revenue and the inability of other revenue sources to keep up with increased costs. If Section 3 transition entitlements are fully funded, effects would be less severe and would be apportioned, in reducing amounts, over a 3-year period starting in FY 1994. Cutbacks in service levels and/or additional revenue from new revenue

sources would be required to maintain a balanced fiscal position in the district.

#### **4.6.1.7 Tawas Area Schools**

**Revenues.** Total general and special revenue fund increases due to the additional students under the Proposed Action are projected to be approximately \$284,133 by FY 1998 and \$475,683 by FY 2013. Because the district is "out-of-formula" (the district's tax base by itself is sufficient to provide district funding without reliance on noncategorical program state aid), these revenue increases would be generated principally from increased property taxes (\$441,759 in FY 2013).

**Expenditures and Net Fiscal Effects.** Expenditures, principally from increased direct instruction costs, would increase by \$243,272 by FY 1998 and \$420,650 by FY 2013 for net revenue increases of \$40,861 in FY 1998 and \$55,033 by FY 2013.

**Comparison to Closure Conditions.** The revenue increases would not be sufficient to offset projected closure deficits of \$33,067 (see Section 3.6) in the early years of reuse. From closure through FY 1996, the district would be faced with gradually declining deficits. These shortfalls represent less than 0.1 percent of the district's 1992 operating budget of \$6.2 million. By FY 1997, the positive fiscal effects of this alternative would offset projected deficits due to base closure.

#### **4.6.2 Fire Training Alternative**

Several key assumptions, regarding future jurisdictional control of base property, which influence the fiscal assessments, are presented below:

- The area designated for fire training uses would be conveyed or leased for use by the proposed Great Lakes Fire Training Academy. This organization is proposed to be administered/owned by the Michigan Fire Fighters Training Council, a state agency, and operated under contract by the local community college. Under this organizational structure, land proposed for this use would not be subject to local property taxes.
- Industrial and commercial land use areas would initially remain in public ownership but would be subsequently leased or sold to private interests and would be subject to local property taxes.
- All areas designated for residential use would be sold in the private market and would be subject to local property taxes.

- All areas designated for public/recreation uses would remain in public ownership or be leased to other public agencies, and, therefore, would not be subject to local property taxes.

**4.6.2.1 County of Iosco.** Fiscal effects of this alternative on Iosco County should improve over the post-closure scenario through FY 2013.

**Revenues.** Increased general and special revenue fund revenues would come principally from increased property taxes (from conversion of the base to private use), charges for services, and state-shared revenue. Revenue gains are projected to be \$312,927 by FY 1998 and \$604,987 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in county residents are estimated to require \$80,042 in increased expenditures by FY 1998 and \$175,458 by FY 2013. Projected positive net fiscal effects would be \$232,885 in FY 1998 and \$429,529 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$529,469 (see Section 3.6). The county would be faced with gradually declining deficits from closure through FY 2013. By FY 2013, the county would be faced with deficits of \$99,940 annually. These shortfalls would require some response by the county such as service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

**4.6.2.2 Township of Oscoda.** Fiscal effects of this alternative on Oscoda indicate an improvement compared to the post-closure scenario through FY 2013.

**Revenues.** Increased general and special revenue fund revenues would come principally from increased property taxes (from conversion of a portion of the base to private use), state-shared revenue (sales taxes and other state-shared revenue), and charges for services. These revenue gains are projected to be \$208,712 in FY 1998 and \$400,236 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in township residents are projected to require \$31,140 in increased expenditures by FY 1998 and \$68,201 by FY 2013. Projected positive net fiscal effects would be \$177,572 in FY 1998 and \$332,035 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$238,702 (see Section 3.6) in the early years of reuse. The township would be faced with deficits from closure through FY 2002. These shortfalls would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, or development of new revenue sources. By FY 2003,

the positive fiscal effects of this alternative would offset projected deficits due to base closure.

**4.6.2.3 Township of Au Sable.** Fiscal effects of this alternative on Au Sable indicate an improvement compared to the post-closure scenario through FY 2013.

**Revenues.** Increased general and special revenue fund revenues would come principally from increased state-shared revenue and other miscellaneous sources. These revenue gains are projected to be \$30,606 in FY 1998 and \$59,347 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in township residents are estimated to require \$14,356 in increased expenditures by FY 1998 and \$31,412 by FY 2013. Projected positive net fiscal effects would be \$16,250 in FY 1998 and \$27,935 in FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$30,207 (see Section 3.6). The township would be faced with gradually declining deficits through FY 2013. Deficits would be \$2,272 by FY 2013. These shortfalls would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

**4.6.2.4 County of Alcona.** Fiscal effects of this alternative on Alcona County indicate an improvement compared to the post-closure scenario through FY 2013.

**Revenues.** Increased general and special revenue fund revenues would come principally from increased property taxes (due to the additional housing demand associated with greater population in-migration under reuse compared to out-migration under the closure scenario), charges for services, and state and federal intergovernmental transfers. These revenue gains are projected to be \$106,403 in FY 1998 and \$233,209 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in county residents are projected to require \$65,927 in increased expenditures by FY 1998 and \$144,497 by FY 2013. Projected positive net fiscal effects would be \$40,476 in FY 1998 and \$88,712 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$72,951 (see Section 3.6) in the early years of reuse. The county would be faced with gradually declining deficits from closure through FY 1999. These shortfalls would require some response by the county through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue

**sources.** By FY 2000, the positive fiscal effects of this alternative would offset projected deficits due to base closure.

#### **4.6.2.5 Township of Greenbush.** Fiscal effects of this alternative on Greenbush indicate an improvement over the post-closure scenario.

**Revenues.** Increased general and special revenue fund revenues would principally come from increased property taxes (due to the additional housing demand associated with greater population in-migration under reuse compared to population out-migration under the closure scenario) and state-shared revenue (sales taxes). These revenue gains are projected to be \$12,730 in FY 1998 and \$27,062 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in township residents are estimated to require an increase in expenditures of \$6,137 in FY 1998 and \$13,415 by FY 2013. Projected positive net fiscal effects would be \$6,593 in FY 1998 and \$13,647 in FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$9,055 (see Section 3.6) in the early years of reuse. The township would be faced with gradually declining deficits from closure through FY 2002. These shortfalls would require some response by the township through service cutbacks and/or increases in tax and non-tax revenue schedules. By FY 2003, the positive fiscal effects of this alternative would offset projected deficits due to base closure.

#### **4.6.2.6 Oscoda Area Schools**

**Revenues.** Total general and special revenue fund increases due to the additional students under this alternative are projected to be \$1.1 million in FY 1998 and \$2.3 million by FY 2013. District funding is principally from property taxes and state aid revenues. Funding from both of these sources is limited to approximately \$2,880 per student (in constant 1989 dollars). Based on an increase in the state equalized (assessed) valuation in the district of \$33.1 million by FY 2013 and a 1992 property tax rate of 26.1199 mills (dollars per \$1,000 of assessed valuation), property tax revenues would amount to about \$864,600 in FY 2013. The remainder of the total general and special revenue fund revenue increases would be principally from state aid programs.

**Expenditures and Net Fiscal Effects.** Expenditures, principally from increased direct instruction costs, would increase by \$1.1 million in FY 1998 and \$2.3 million by FY 2013. These expenditure increases would offset projected revenue increases, and no positive net fiscal effects from the Fire Training Alternative are expected.

**Comparison to Closure Conditions.** The fiscal effects of this alternative would not be sufficient to offset projected closure deficits. In both the short and long term, revenue shortfalls would be approximately \$2.2 million. This is due principally to the loss of P.L. 81-874 funds, which would not be replaced with state source revenue, and the inability of other revenue sources to keep up with increased costs. If Section 3 transition entitlements are fully funded, effects would be less severe and apportioned in reducing amounts over a 3-year period starting in FY 1994. Cutbacks in service levels and/or additional revenue from new revenue sources would be required to maintain a balanced fiscal position in the district.

#### **4.6.2.7 Tawas Area Schools**

**Revenues.** Total general and special revenue fund increases due to the additional students under this alternative are projected to be approximately \$121,315 in FY 1998 and \$268,170 by FY 2013. Because the district is "out of formula" (the district's tax base by itself is sufficient to provide district funding without reliance on noncategorical program state aid), these revenue increases would be generated principally from increased property taxes (\$249,045 in FY 2013).

**Expenditures and Net Fiscal Effects.** Expenditure increases, principally from increased direct instruction costs, would be \$92,500 in FY 1998 and \$228,490 by FY 2013. Projected positive net fiscal effects would be \$28,815 in FY 1998 and \$39,680 in FY 2013.

**Comparison to Closure Conditions.** The revenue increases would not be sufficient to offset projected closure deficits of \$35,067 (see Section 3.6) in the early years of reuse. The district would be faced with gradually declining deficits through FY 2003. These shortfalls would represent less than 0.1 percent of the district's operating budget of \$6.2 million. By FY 2004, the positive fiscal effects of this alternative would offset projected deficits due to base closure.

#### **4.6.3 Recreation Alternative**

Several key assumptions, regarding future jurisdictional control of base property, which influence the fiscal assessments, are presented below:

- The institutional land use area would be conveyed or leased to public agencies and thus would not be subject to property taxes.
- The areas designated for industrial and commercial use would initially remain in public ownership but would be subsequently leased or sold to private interests and subject to property taxes.



- All areas designated for residential use would be sold in the private market and would be subject to local property taxes.
- All areas designated for public/recreation uses would remain in public ownership or be leased to other public agencies, and therefore, would not be subject to local property taxes.

**4.6.3.1 County of Iosco.** Fiscal effects of this alternative on Iosco County should improve compared to the post-closure scenario.

**Revenues.** Increased general and special revenue fund revenues would come principally from increased property taxes (from conversion of a portion of the base to private use), charges for services, and state-shared revenue. These revenue gains are projected to be \$126,892 in FY 1998 and \$316,701 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in county residents are estimated to require \$37,087 in increased expenditures by FY 1998 and \$105,334 by FY 2013. Projected positive net fiscal effects would be \$89,805 in FY 1998 and \$211,367 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$529,469 (see Section 3.6). The county would be faced with gradually declining deficits from closure through FY 2013. These shortfalls would require some response by the county through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 2013, revenue shortfalls are projected to be \$318,102 annually.

**4.6.3.2 Township of Oscoda.** Fiscal effects of this alternative on the township of Oscoda indicate an improvement compared to the post-closure scenario.

**Fiscal Effects.** Increased general and special revenue fund revenues would come principally from increased property taxes (from conversion of a portion of the base to private use), state-shared revenue (sales taxes and other state-shared revenue), and charges for services. These revenue gains are projected to be \$119,146 in FY 1998 and \$232,396 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in township residents are projected to require an increase in expenditures of \$14,427 in FY 1998 and \$40,958 by FY 2013. Projected positive net fiscal effects under this alternative would be \$104,719 in FY 1998 and \$191,438 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$238,702 (see Section 3.6).

The township would be faced with gradually declining deficits through FY 2013. These shortfalls would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, or development of new revenue sources. By FY 2013, revenue shortfalls of \$47,264 annually are projected.

**4.6.3.3 Township of Au Sable.** Fiscal effects of this alternative on the township of Au Sable indicate an improvement compared to the post-closure scenario.

**Revenues.** Increased general and special revenue fund revenues would principally come from increased state-shared revenue and other miscellaneous sources. These revenue gains are projected to be \$17,593 in FY 1998 and \$38,190 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in township residents are estimated to require \$6,633 in increased expenditures in FY 1998 and \$18,857 by FY 2013. Projected positive net fiscal effects would be \$10,960 in FY 1998 and \$19,333 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$30,207 (see Section 3.6). The township would be faced with gradually declining deficits through FY 2013. These shortfalls would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 2013, revenue shortfalls of \$10,874 annually are projected.

**4.6.3.4 County of Alcona.** Fiscal effects of this alternative on Alcona County indicate an improvement compared to the post-closure scenario through FY 2013.

**Revenues.** Increased general and special revenue fund revenues would come principally from increased property taxes (due to the additional housing demand associated with greater population in-migration under reuse compared to out-migration under closure), charges for services, and state and federal intergovernmental transfers. These revenue gains are projected to be \$49,272 in FY 1998 and \$140,107 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands as a result of the increase in county residents are estimated to require \$30,529 in increased expenditures by FY 1998 and \$86,811 by FY 2013. Projected positive net fiscal effects would be \$18,743 in FY 1998 and \$53,296 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset closure deficits of \$44,787 (see Section 3.6) in the early years of reuse. The county would be faced with gradually declining deficits

through FY 2009. These shortfalls would require some response by the county through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 2010, the positive fiscal effects of this alternative will have offset projected deficits due to base closure.

#### **4.6.3.5 Township of Greenbush. Fiscal effects of this alternative on Greenbush indicate an improvement compared to the post-closure scenario.**

**Revenues.** Increased general and special revenue fund revenues would come principally from increased property taxes, state-shared revenue, and charges for services. These revenue gains are projected to be \$6,211 in FY 1998 and \$16,495 by FY 2013.

**Expenditures and Net Fiscal Effects.** Service demands associated with new township residents are projected to require an increase in expenditures of \$2,826 by FY 1998 and \$8,049 by FY 2013. Projected positive net fiscal effects would be \$3,385 in FY 1998 and \$8,446 by FY 2013.

**Comparison to Closure Conditions.** The net revenue increases would not be sufficient to offset projected closure deficits of \$9,055 (see Section 3.6). The township would be faced with gradually declining deficits through FY 2013. These shortfalls would require some response by the township through service cutbacks and/or increases in tax and non-tax revenue schedules. By FY 2013, revenue shortfalls of \$609 annually are projected.

#### **4.6.3.6 Oscoda Area Schools**

**Revenues.** Total general and special revenue fund increases due to the additional students under this alternative are projected to be \$497,537 in FY 1998 and \$1.4 million by FY 2013. District funding is principally from property taxes and state aid revenues. Funding from both these sources is limited to approximately \$2,880 per student (in constant 1989 dollars). Based on an increase in the state equalized (assessed) valuation in the district of \$17.3 million by FY 2013 and a 1992 property tax rate of 26.1199 mills (dollars per \$1,000 of assessed valuation), property tax revenues would amount to about \$452,000 by FY 2013. The remainder of the total general and special revenue fund revenue increases would principally be from state aid programs.

**Expenditures and Net Fiscal Effects.** Expenditures, principally from increased direct instruction costs, would increase by \$497,288 in FY 1998 and \$1.4 million by FY 2013. These expenditure increases would offset projected revenue increases, and no net fiscal effects under this alternative are expected.

**Comparison to Closure Conditions.** The fiscal effects of this alternative would not be sufficient to offset projected closure deficits. In both the short and long term, revenue shortfalls would be approximately \$2.2 million. This is due primarily to the loss of P.L. 81-874 funds, which would not be replaced with state source revenue, and the inability of other revenue sources to keep up with increased costs. If Section 3 transition entitlements are fully funded, effects would be less severe and apportioned in reducing amounts over a 3-year period starting in FY 1994. Cutbacks in service levels and/or additional revenue from new revenue sources would be required to maintain a balanced fiscal position in the district.

#### **4.6.3.7 Tawas Area Schools**

**Revenues.** Total general and special revenue fund increases due to the additional students generated under this alternative are projected to be approximately \$57,465 in FY 1998 and \$159,625 by FY 2013. Because the district is "out-of-formula" (the district's tax base by itself is sufficient to provide district funding without reliance on noncategorical program state aid), these revenue increases are principally from increased property taxes (\$148,242 in FY 2013).

**Expenditures and Net Fiscal Effects.** Expenditure increases, principally from increased direct instruction costs, would increase by \$33,374 in FY 1998 and \$127,976 by FY 2013. Projected positive net fiscal effects would be \$24,091 in FY 1998 and \$31,649 by FY 2013.

**Comparison to Closure Conditions.** The revenue increases would not be sufficient to offset projected closure deficits of \$33,067 (see Section 3.6) through FY 2013. The district would be faced with gradually declining deficits through FY 2013. Revenue shortfalls would still be \$1,418 annually in FY 2013. These shortfalls represent less than 0.1 percent of the district's 1992 operating budget of \$6.2 million.

#### **4.6.4 No-Action Alternative**

Public finance effects of the No-Action Alternative are the same as those described in Section 3.6 as closure conditions, and would remain constant for the 20-year period.

### **4.7 TRANSPORTATION**

The effects of the Proposed Action and alternatives on roadways are presented in this section. Because neither the Proposed Action nor any of the alternatives assumes direct use of local railroads or other modes of transportation, including air transportation, effects on these methods of transport are expected to be minimal and are not included in the study. A

more detailed discussion is presented in Section 4.2.3 of the *EIS for Disposal and Reuse of Wurtsmith AFB*.

For the purpose of this analysis, the regional road most likely to be affected by the reuse alternatives is U.S. 23 in Oscoda and Au Sable (see Figure 3.7-1). The local roads most likely affected would be County Road F-41 and Cedar Lake, Loud, River, Rea, and Bissonette roads.

Based on the reuse development schedule for each land use, the variation in vehicle trips generated by the on-site activities has been determined for the average weekday and for the morning and afternoon peak hours.

The distribution of trips to and from the site is based on existing travel patterns for commuters and on the locations of residences of base personnel as obtained from zip code data. It was assumed that the residential choices of the project-related employees would correspond to those of the current base personnel. The resulting peak-hour volumes from the project were then added to the July peak hour of non-project-generated traffic (background) projected under post-closure baseline conditions. Traffic peaks in the summer months due to the number of recreational visitors to the area. Future traffic in the area was projected using average population growth rates during the period of analysis, and applied to all of the existing traffic movements and volumes on key roads.

Traffic effects were determined based on LOS changes for each of the key roads. Intersections along key roads that would experience heavy traffic were examined for deficiencies. Details on reuse are not sufficiently developed to permit an in-depth evaluation of intersection capacities.

With Wurtsmith AFB closed and in caretaker status (the No-Action Alternative), key local roads would experience a net reduction in traffic volume which would lead to LOS B or better throughout the analysis period. However, key regional road segments on U.S. 23 in Oscoda and Au Sable would operate at LOS E by 2003 and continue to deteriorate thereafter due to growth in traffic volumes. By 2013, U.S. 23 at the F-41 junction would operate at LOS F, compared to LOS E before preclosure.

#### **4.7.1 Proposed Action**

Traffic generated as a result of the Proposed Action land uses and direct employment is estimated to be 29,600 vehicles per day for a typical weekday by the year 2013 (Table 4.7-1). These trips include construction activity and pass-by trips created by the Proposed Action. The projected afternoon peak hour would amount to 3,050 vehicles, which represent a little more than 10 percent of the total number of daily trips. The morning peak hour would amount to 2,650 vehicles, which represent a little less than 9 percent of the total daily trips. Based on the proposed

**Table 4.7-1 Average Daily Trip Generation**

	1998	2003	2013
Proposed Action	17,000	25,600	29,600
Fire Training Alternative	16,900	21,900	26,100
Recreation Alternative	12,700	16,600	21,000
No-Action Alternative	500	500	500

**Note:** Daily trips shown are defined as one-way vehicle trips. All values are rounded to the nearest 100.

redevelopment schedule, the traffic generated by the Proposed Action would increase steadily during the 20-year study period.

The Proposed Action includes six access points to the site. However, most traffic generated by the proposed development is likely to use only three access points: the existing access at the Main Gate, the proposed access aligned with Arrow Street, and the proposed northern access aligned with Van Etten Street.

By the year 1998, the LOS at the intersection of U.S. 23 and County Road F-41 would deteriorate to the preclosure condition of level F; other segments along U.S. 23 would continue to operate at LOS E or better. By 2013, LOS on all segments of U.S. 23 within Oscoda and Au Sable would have dropped to levels E or F.

Although the Michigan Department of Transportation is considering improvements along segments of U.S. 23 south of Au Sable and Oscoda, there are no plans to improve segments of this highway within these communities. Throughout the 20-year period of analysis, all other key local roads would operate at LOS D or better. The intersections on County Road F-41 are likely to experience numerous left- and right-turn movements during peak hours and by 1998 the LOS along that segment of County Road F-41 would drop to D.

The Proposed Action assumes existing on-base roads would be used during the construction period, but eventually the on-base network would be upgraded where local development plans dictate a need based on community standards for acceptable LOS.

The implementation of the Proposed Action could increase ridership on the local bus system (Iosco Transit Corporation); however, the projected effects would be minimal.

#### **4.7.2 Fire Training Alternative**

Traffic generated as a result of the Fire Training Alternative land uses and direct employment is estimated at 26,100 vehicles per day by 2013 (see Table 4.7-1). These trips include construction activity and pass-by trips created by this alternative. The project is expected to add 2,450 vehicles during the afternoon peak hour and 1,800 vehicles during the morning peak hour.

The Fire Training Alternative includes six access points to the site. Five are identical to those for the Proposed Action and the sixth access is on Rea Road in the far western section of the base. A major east-west arterial connecting County Road F-41 and Rea Road, following the alignment of the existing Perimeter Road south of the airfield, is proposed to induce development and promote regional accessibility. As for the Proposed Action, most traffic entering or leaving the base would use three access points on County Road F-41 at the Main Gate, Arrow Street, and Van Etten Street. The existing Capehart Gate would provide access to the residential area. The trip distribution to various access points is similar to those assumed for the Proposed Action.

By 1998, the LOS along some segments of U.S. 23 would deteriorate to the preclosure condition of F; other segments along this highway would continue to operate at LOS E or better. By 2013, LOS on all segments of U.S. 23 within Oscoda and Au Sable would have dropped to E or F. Although the Michigan Department of Transportation is considering improvements along segments of U.S. 23 south of Au Sable and Oscoda, there are no plans to improve segments of this highway within these communities. Throughout the 20-year period of analysis, all other key local roads would operate at LOS D or better. As under the Proposed Action, the intersections on County Road F-41 are likely to experience numerous left- and right-turn movements during peak hours and by 1998 the LOS along this segment of County Road F-41 would drop to level D.

The Fire Training Alternative assumes that existing on-base roads would be used during the construction period, but eventually the on-base network would be upgraded as needed to meet community standards for acceptable LOS.

The implementation of the Fire Training Alternative could result in a minimal increase in ridership on the local bus system (Iosco Transit Corporation).

#### **4.7.3 Recreation Alternative**

Traffic generated under the Recreation Alternative land uses and direct employment is estimated at 21,000 vehicles per day by 2013 (see Table 4.7-1). The project is expected to add 2,000 vehicles during the

afternoon peak hour and 1,420 vehicles to the morning peak hour. Based on the proposed development schedule, the traffic generated by the Recreation Alternative would increase steadily during the 20-year study period.

The Recreation Alternative includes six access points to the site, identical to those for the Fire Training Alternative. Trip distribution and assignment to various access points are the same as those assumed for the Fire Training Alternative. The access points at Arrow Street and the Main Gate are likely to experience the greatest percentage of trips.

By 1998, the LOS along some segments of U.S. 23 would deteriorate to the preclosure condition of level F; other segments along this highway would continue to operate at LOS E or better. By 2013, LOS on all segments of U.S. 23 within Oscoda and Au Sable would have dropped to level E or F. Although the Michigan Department of Transportation is considering improvements along segments of U.S. 23 south of Au Sable and Oscoda, there are no plans to improve segments of this highway within these communities. Throughout the 20-year period of analysis, all other key local roads would operate at LOS D or better. As under the Proposed Action, the intersections on County Road F-41 are likely to experience numerous left- and right-turn movements during peak hours and by 1998 the LOS along this segment of County Road F-41 would drop to level D.

The Recreation Alternative assumes that existing on-base roads would be used during the construction period, but eventually the on-base network would be upgraded as needed to community standards for acceptable LOS.

The implementation of the Recreation Alternative could result in a minimal increase in ridership on the local bus system (Iosco Transit Corporation).

#### **4.7.4 No-Action Alternative**

Transportation effects of the No-Action Alternative would be the same as those conditions described in Section 3.7. With Wurtsmith AFB closed and in caretaker status, transportation demands in the study area would vary in relation to area population.

## **4.8 UTILITIES**

This section describes the type of utility demand and subsequent infrastructure changes that would be required under each reuse alternative. The specific on-base infrastructure improvements needed, and the associated costs for such improvements, would be borne by the future site developer(s).



With Wurtsmith AFB closed and in caretaker status (the No-Action Alternative), utilities consumption would decrease as population decreases through 2013.

Changes in total regional utility demand were derived from the estimated number of regional in-migrants by applying a regional per-capita use rate. On-site demands were estimated by applying use rates to appropriate land use units. A more detailed discussion is given in Section 4.2.4 of the *EIS for the Disposal and Reuse of Wurtsmith AFB, Michigan*.

The Proposed Action would generate the greatest utility demand. The Michigan Department of Public Health had indicated that on-base wells may be used in the short term, but reusers of the base would need to identify another water source for long-term supply. The surrounding communities are evaluating their water supply needs. Oscoda Township is pursuing funding to connect the on-base sewage collection system to the Oscoda WWTP. It is assumed that reusers of the base property would continue to use the base sanitary sewer system under a Groundwater Discharge Permit with waiver from the Michigan Department of Natural Resources until the connection to the Oscoda WWTP is completed and in operation. Upgrades to the Oscoda WWTP would be required over the 20-year analysis period to accommodate increased flows generated by the in-migrating population as redevelopment of the base property progresses.

#### **4.8.1 Proposed Action**

A summary of regional utility demand changes associated with the Proposed Action is shown in Table 4.8-1. Under the Proposed Action, the demand for water, wastewater, solid waste disposal, electricity, and natural gas would increase by 33 to 55 percent of the demand projected under post-closure conditions through 1998. By 2013, the overall increase in utility demand associated with the Proposed Action would range from 57 to 92 percent above projected post-closure conditions. At that time, overall demand for water and wastewater treatment would be less than or approximately equal to preclosure (1990) levels.

The increased population and resulting increase in utility demand of the Proposed Action would not, in general, offset the decline in demand associated with the loss of population in Iosco County following the base closure. Various utility providers may be able to postpone scheduled infrastructure improvements until such time that demands require implementation.

#### **4.8.2 Fire Training Alternative**

A summary of utility demand changes associated with this alternative is shown in Table 4.8-1. Increase in utility demand through 1998 would

**Table 4.8-1. Total Projected Utility Demand**  
**Page 1 of 2**

	1998			2003			2013		
	Total ROI	Reuse-Related	Percent Increase	Total ROI	Reuse-Related	Percent Increase	Total ROI	Reuse-Related	Percent Increase
<b>Water Consumption (MGD)</b>									
No-Action	1.44			1.44			1.43		
Proposed Action	1.92	0.48	33	2.04	0.60	42	2.24	0.81	57
Fire Training Alternative	1.65	0.21	15	1.76	0.32	22	1.89	0.46	32
Recreation Alternative	1.54	0.10	7	1.61	0.17	12	1.71	0.28	20
<b>Wastewater Treatment (MGD)</b>									
No-Action	1.16			1.16			1.15		
Proposed Action	1.56	0.40	34	1.66	0.50	43	1.82	0.67	58
Fire Training Alternative	1.33	0.17	15	1.42	0.26	22	1.53	0.38	33
Recreation Alternative	1.24	0.08	7	1.30	0.14	12	1.38	0.23	20
<b>Solid Waste Disposal (tons/day)</b>									
No-Action	20.5			20.5			20.4		
Proposed Action	30.1	0.6	47	32.4	11.9	58	36.4	16.0	78
Fire Training Alternative	24.7	4.2	20	26.8	6.3	31	29.6	9.2	45
Recreation Alternative	22.4	1.9	9	23.9	3.4	17	25.9	5.5	27

*Wurtsmith AFB Disposal and Reuse SIAS*

**Table 4.8-1. Total Projected Utility Demand**  
Page 2 of 2

	1998			2003			2013		
	Total ROI	Reuse-Related	Percent Increase	Total ROI	Reuse-Related	Percent Increase	Total ROI	Reuse-Related	Percent Increase
<b>Electrical Consumption (MWH/day)</b>									
No-Action	87.5			87.5			87.1		
Proposed Action	135.8	48.3	55	148.5	60.0	69	167.6	80.5	92
Fire Training Alternative	108.4	20.9	24	119.3	31.8	36	133.1	46.0	53
Recreation Alternative	97.2	9.7	11	104.6	17.1	20	114.5	27.4	31
<b>Natural Gas Consumption (thousands of therms/day)</b>									
No-Action	18.1			18.1			18.1		
Proposed Action	25.0	6.9	38	26.6	8.5	47	29.5	11.4	63
Fire Training Alternative	21.1	3.0	17	22.6	4.5	25	24.6	6.5	37
Recreation Alternative	19.5	1.4	8	20.6	2.5	14	22.0	3.9	22

*Wurtsmith AFB Disposal and Reuse SIAS*

remain at or below 24 percent of the demand projected under post-closure conditions for this alternative. Long-term increases in utility demand from this reuse alternative would range from 32 to 53 percent over post-closure conditions by 2013. Utility demand increases related to this reuse alternative would be less than those identified under the Proposed Action. Various utility providers may be able to postpone scheduled infrastructure improvements until such time that demands require implementation.

#### **4.8.3 Recreation Alternative**

A summary of utility demand changes associated with this alternative is shown in Table 4.8-1. Increase in utility demand through 1998 would remain at or below 11 percent of the demand projected under post-closure conditions. Long-term increases in utility demand from the Recreation Alternative would range from 20 to 31 percent over post-closure conditions by 2013.

By 2013, utility demand related to this reuse alternative would be less than that identified under the Proposed Action and Fire Training Alternative. Various utility providers may be able to postpone scheduled infrastructure improvements until such time that demands require implementation.

#### **4.8.4 No-Action Alternative**

Utility effects for the No-Action Alternative would be those described in Section 3.8 as closure conditions.

### **4.9 OTHER LAND USE CONCEPTS**

The proposed land use concept would be initiated on an individual basis rather than as part of an integrated reuse alternative. The potential effects of this land use concept are discussed in relation to its effect on the Proposed Action and alternatives.

**Advanced Environmental Technology Facility.** The Great Lakes and Mid-Atlantic Hazardous Substance Research Center is proposing to establish a national facility at Wurtsmith AFB for field research, development, and demonstration of advanced applied technologies for the decontamination and bioremediation of hazardous wastes, spills, and disposal sites. This facility would involve use of the bioenvironmental engineering laboratory to conduct sample analysis, and the vehicle maintenance facility to store vehicles and equipment. The facility staff and students would conduct on-site research at contaminated sites on the base. It is estimated that, over the 20-year analysis period, the facility would accommodate up to 20 direct permanent employees and up to 40 students per year, who would work at the facility temporarily (from 1 week to 3 months each).

This facility would be located in the industrial and institutional (medical) land use areas of the Proposed Action and the two reuse alternatives, and would result in minimal net effect (less than 1.0 percent) in employment or population when compared to the effects of the reuse alternatives themselves.

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## **5.0 CONSULTATION AND COORDINATION**

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The federal, state, and local agencies and private agencies/organizations that were contacted during the course of preparing this Socioeconomic Impact Analysis Study are listed below.

### **FEDERAL AGENCIES**

U.S. Department of Commerce, Bureau of the Census  
U.S. Department of Commerce, Bureau of Economic Analysis  
U.S. Department of Veterans Affairs

### **STATE AGENCIES**

Michigan Department of Natural Resources  
Michigan Department of Transportation  
Michigan Economic Security Commission  
Michigan Office of Tax and Revenue Analysis  
Michigan Public Health Department  
Michigan State Police  
Office of State Registrar and Center for Health Statistics

### **LOCAL/REGIONAL AGENCIES**

Alcona County Building and Housing Office  
Alcona County Sheriff  
Alpena Community College  
Arenac County  
Arenac County Housing Commission  
Arenac County Sheriff  
Au Sable Township  
East Central Michigan Planning and Development Region  
East Tawas Fire Department  
Greenbush Township  
Hale Area Schools  
Harrisville, City of  
Iosco County  
Iosco County Airport  
Iosco County Board of Commissioners  
Iosco County Building Permit Public Counter  
Iosco County Housing Commission  
Iosco County Road Commission  
Iosco County Sheriff  
Iosco Intermediate School District

Northeast Michigan Council of Governments  
Oscoda Area Schools  
Oscoda Township  
Oscoda Township Fire Department  
Oscoda Township Office of Economic Adjustment  
Oscoda Township Police Department  
Saginaw Valley State University  
Tawas Area Schools  
Tawas City  
Tawas City Fire Department  
Tawas Utility Authority  
Whittemore-Prescott Area Schools  
Wurtsmith Area Economic Adjustment Commission

#### **PRIVATE ORGANIZATIONS**

Consumers Power Company  
Hager Sanitation Services  
Lake State Railway Company  
Michigan Consolidated Gas Company  
National Planning Association - Data Services  
Oscoda-Au Sable Chamber of Commerce  
Tawas Area Chamber of Commerce  
Williams and Works Operation Services



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## APPENDICES

## **APPENDIX A**

### **DATA SOURCES**

#### **Economic Activity**

County-level jobs and earnings data, provided by the major industrial sector and personal income data, were obtained for the years 1969 through 1990 from the Regional Economic Information System (U.S. Bureau of Economic Analysis, 1992b). Indices for the conversion of current year dollars to constant 1989 dollars were provided in the Economic Report of the President prepared by the U.S. Council of Economic Advisers (1992). Data pertaining to the labor force and employed and unemployed workers in Iosco, Alcona, Alpena, and Arenac counties were obtained from the Michigan Employment Security Commission (1977, 1984, 1991a, 1991b, 1992). Information concerning the largest employers in the area near Wurtsmith AFB was obtained from the Iosco County Economic Development Office (1992). Data concerning Wurtsmith AFB personnel, payrolls, and spending within the region were obtained from Wurtsmith AFB Economic Resource Impact Statements (U.S. Air Force, 1987; 1988; 1989b; 1990b; 1991). Regional output, earnings, and jobs multipliers were obtained from the Regional Input-Output Multiplier System (RIMS II) for the four-county ROI consisting of Iosco, Alcona, Alpena, and Arenac counties (U.S. Bureau of Economic Analysis, 1992a).

#### **Population**

The primary source of population data for this study was the U.S. Bureau of the Census. The data examined included the 1990 Census of Population and Housing for the United States (U.S. Bureau of the Census, 1991a). Supplemental population data were obtained from the 1980 Census of Population (U.S. Bureau of the Census, 1982a), which when compared with the 1990 data provided the change in the ROI during the last decade. Population projections prepared for individual counties by the Office of Tax and Revenue Analysis of the Michigan Department of Management and Budget provided insights on anticipated population changes in the four-county ROI over the next two decades (Michigan Department of Management and Budget, 1985). Specific county and community concerns and information regarding population growth in certain portions of the ROI are detailed in selected planning documents (Ronald F. Nino and Associates, 1987; An Advisory Committee of Oscoda Residents, 1990; Frahm, 1991). Air Force personnel data by zip code for both military and civilian personnel at Wurtsmith AFB were used to determine the distribution of employees within the ROI (U.S. Air Force, 1992a).

## Housing

The major source on housing characteristics in the ROI was the 1990 Census of Population and Housing (U.S. Bureau of the Census, 1991a). Additional housing data were obtained from the 1980 Census of Housing (U.S. Bureau of the Census, 1982b). An examination of the census data provided a comparison of change over time for several key housing characteristics. Data in the Current Construction Report Series provided information on housing units authorized by building permits, thereby indicating the capacity of the construction industry to provide housing within selected parts of the ROI (U.S. Bureau of the Census, 1981, 1982c, 1983b, 1984, 1985, 1986, 1987a, 1988, 1989, 1990, 1991b). Supplemental housing data were derived from various other state, county, community, and private sector sources, including the General Development Plan for Oscoda Township (Ronald F. Nino and Associates, 1987).

## Public Services

Information regarding staffing levels, jurisdictional boundaries, degrees of use, equipment, and facilities for public service providers was acquired directly through personal communication with agency representatives (Huffine, 1992; Kondrat, 1992; Krebel, 1992; Lavack, 1992; Mathews, 1992; Parsons, 1992; Roddy, 1992; Schirmer, 1992; Wright, 1992) and from documents published by state agencies (Michigan Bureau of Health Systems, 1992; Michigan Office of State Registrar and Center for Health Statistics, 1988). Additional information regarding public education was obtained from the Michigan Board of Education (1992), Oscoda Area Schools (1992), Tawas Area Schools (1992), other local school districts (Gunnell, 1992; Iosco Intermediate School District, 1992; McLean, 1992), and the National Center for Education Statistics (1991). These data included enrollment data for local school districts. Information on security and fire protection provided by the federal government within the boundaries of Wurtsmith AFB was acquired from representatives of the base.

## Public Finance

Data sources for public finance included the most recent financial reports, typically from FY 1989 through FY 1991, and the current year budget reports for the potentially affected local government units in the ROI (Alcona County, 1989, 1990, 1991; Au Sable, 1989, 1990, 1991; Greenbush, 1989, 1991; Iosco County, 1989, 1990, 1991; Michigan Department of Education, 1991; Oscoda, 1989, 1990, 1991; Oscoda Area Schools, 1989, 1990, 1991; Tawas Area Schools, 1989, 1990, 1991; Weinlander, et al., 1990, 1991). The financial reports provided the actual amount of revenue collected and money spent compared to budgeted levels during the covered

period. Budget reports were used as sources of property tax rate and assessed valuation information.

### Transportation

Data regarding road and highway transportation such as maps, circulation plans, highway improvement plans, and traffic volume counts were collected from Wurtsmith AFB, local jurisdictions, and the Michigan Department of Transportation in Lansing (Ayres Associates, 1990; Bailey, 1992; Buchanan, 1992; Gorski, 1992; Iosco County Road Commission, 1992; Michigan Department of Transportation, 1990, 1991a, 1992a, 1992b; Military Traffic Management Command Transportation Engineering Agency, 1975; U.S. Air Force, 1989a, 1990a, 1990b). Information regarding regional rail transportation was obtained from AMTRAK (Michigan Department of Transportation, 1991b) and the Lake State Railway Company (Garry, 1992).

### Utilities

Representatives from various responsible organizations at Wurtsmith AFB, including Civil Engineering and the Comptroller's Office, provided historic consumption data, peak demand characteristics, storage and distribution capacities, engineering reports, and related information for base utilities (Gershman, Brickner & Bratton, Inc., 1986; Stearns-Roper Services, Inc., 1984; The Earth Technology Corporation, 1988a, 1988b, 1988c; U.S. Air Force, 1992b). Information also was obtained from the Wurtsmith AFB Comprehensive Plan (Ayres Associates, 1990; U.S. Air Force, 1990b, 1990d). Public and private utility purveyors and related county and local agencies also were contacted to obtain similar types of information, including projections of future utility demand for the particular service areas of each utility provider (Hager, 1992; Kenyon, 1992; King, 1992; Smith, 1992; Wade-Trim/Edmands, 1992; Wastewater Operation Services, 1990a, 1990b, 1991a, 1991b, 1992a, 1992b).



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## **APPENDIX B**

### **METHODS**

This section presents methods used to evaluate preclosure and future socioeconomic conditions, both for post-closure without reuse (closure and caretaker status) and for the Proposed Action and alternatives. The description of preclosure socioeconomic conditions includes important indicators that provide a basis for comparison to national trends, as well as to future conditions with and without the Proposed Action and alternatives.

All changes associated with Proposed Action and alternatives over the No-Action Alternative were considered effects. The No-Action Alternative was considered equivalent to closure baseline conditions.

Historic data were used to define existing conditions and recent trends, as well as to develop projections of future socioeconomic conditions that would result from base closure without reuse. The preclosure to closure conditions (Chapter 3) identify any potential beneficial or limiting factors present within the region. The assessment (Chapter 4) then determines whether such factors might make the region either more or less susceptible to negative socioeconomic effects as a result of the Proposed Action and alternatives.

#### **Region of Influence**

Definition of the region of influence (ROI) occurred in two steps. Initially, in support of the Base Closure and Realignment Commission in 1991, an ROI was defined for each of the 106 Air Force bases being evaluated for the potential socioeconomic effects of closure. Starting with the host county, the ROI was extended to other adjacent counties taking into consideration such factors as the proximity of primary communities in the surrounding area and the existing transportation network, until about 90 percent of the residences of base personnel were considered to have been included. This initial ROI was subsequently refined as data gathering for the Socioeconomic Impact Analysis Study (SIAS) gave a clearer picture of the area around the base.

The factor of primary importance in determining the ROI used in this analysis was the distribution of residences for military and civilian personnel stationed at Wurtsmith Air Force Base (AFB) in April 1992. This residential distribution has a critical influence on where the greatest effects of closure will occur. It also provides a useful guide to the possible effects of reusing the base, since it reflects current availability of suitable housing, existing commuting patterns, and attractiveness of area communities for people employed on the site. The distribution of both civilian and military personnel

serves to quantify the effects of closure. However, the distribution of civilian personnel is used only to estimate the future distribution of direct worker residences.

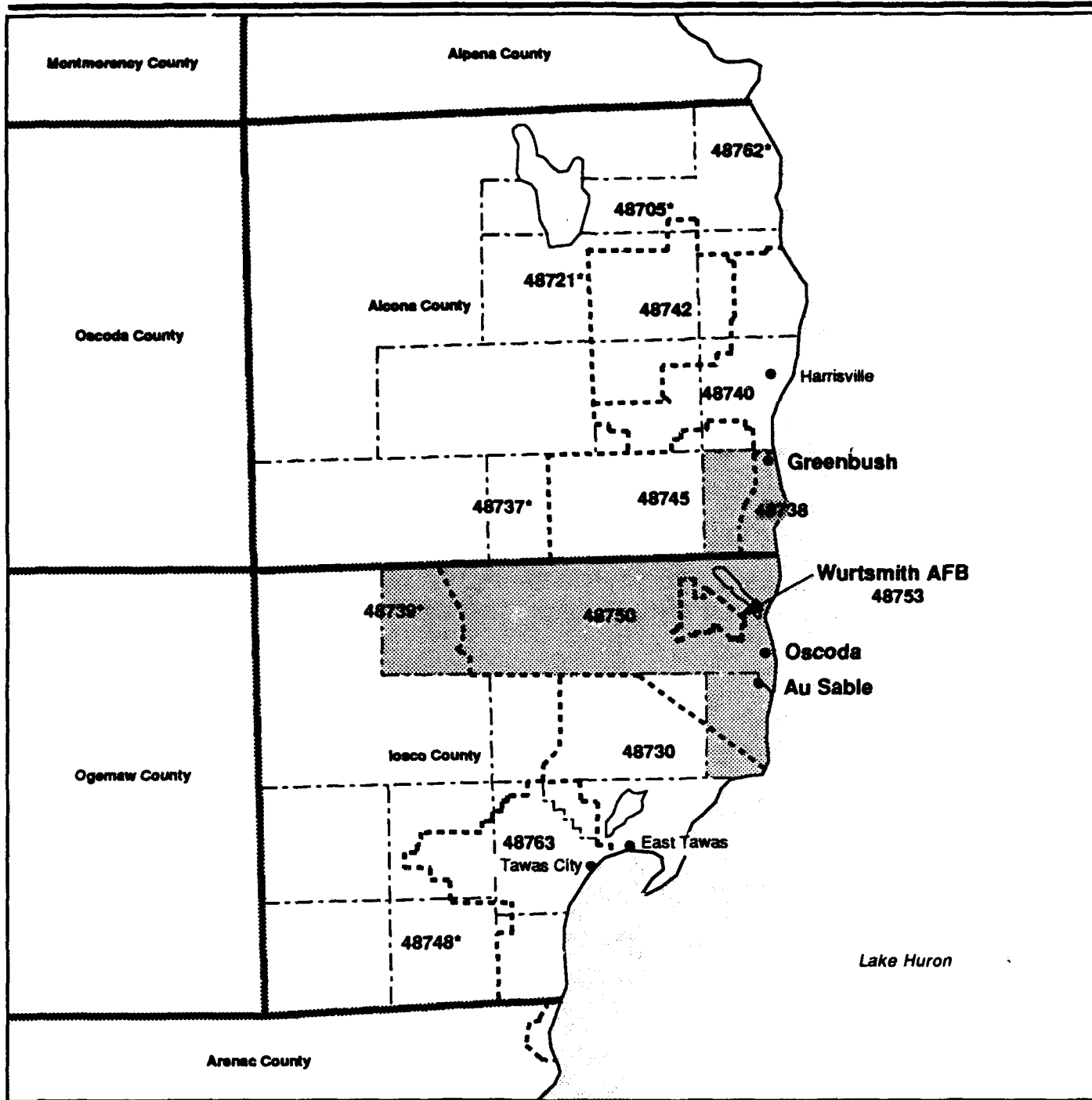
Table B-1 displays the residential distribution by township and zip code for all personnel employed at the base for whom residence data are available. Townships and counties were used to present and analyze this information because they provided a comprehensive and mutually exclusive coverage of the entire geographic area. Data on the zip codes of residences for approximately 80 percent of base personnel were obtained from the base personnel offices; zip code data for the remaining 20 percent of base personnel were not available. Zip codes were mapped to townships and counties (Figure B-1) to derive the information presented in Table B-1. Most base personnel live within the boundaries of Oscoda, Au Sable, and Greenbush townships. The number of base personnel, excluding their dependents, residing in each area is compared to area population in Table B-2.

**Table B-1. Residential Locations of Wurtsmith AFB Military and Civilian Personnel by Township, Zip Codes, and County**

County and Township	Zip Codes	Military Personnel	Civilian Personnel	Total Personnel	Percent of Total
<b>Iosco County</b>					
Oscoda Township	48753 and parts of 48750, 48739	2,372	131	2,503	82.4
Au Sable Township	Parts of 48750 and 48730	180	48	228	7.5
Remainder of Iosco County	48763, 48748, and parts of 48730 and 48739	49	35	84	2.8
<b>Alcona County</b>					
Greenbush Township	48738 and part of 48745	58	34	92	3.0
Rest of Alcona County	48740, 48742, 48737, 48762, 48705, 48721, and part of 48745	38	77	115	3.8
Alpena County	49707, 49747, 49753	0	12	12	0.4
Arenac County	48749, 48765, 48766	2	1	3	0.1
<b>ROI Total</b>		<b>2,699</b>	<b>338</b>	<b>3,037</b>	<b>100.0</b>

**Notes:** Data for residence zip codes are from base personnel records. Data for civilian personnel are for appropriated fund personnel only. Allocations to township portions of zip codes were based on approximate land areas.

**Source:** Mapping to township and county areas prepared for this study were based on information from U.S. Postal Service, 1992.



# EXPLANATION

----- Zip Code Boundary

--- Township Boundary

==== County Boundary

Primary Townships by Zip Code for Base Personnel



Note: Zip codes with asterisks are approximated, based on personal communications with local U.S. postal service personnel. Zip code boundary map is not available for area.

## Zip Codes, Townships, and Counties in Vicinity of Wurtsmith AFB

Figure B-1

**Table B-2. Population and Wurtsmith AFB Military and Civilian Personnel Residences  
by County and Township**

County and Township	Wurtsmith AFB Personnel	1990 Area Population	Personnel as Percent of Population
Iosco County	2,815	30,209	9.3
Oscoda Township	2,503	11,958	20.9
Au Sable Township	228	2,312	9.9
Rest of County	84	15,939	0.5
Alcona County	207	10,145	2.0
Greenbush Township	92	1,373	6.7
Rest of County	115	8,772	1.3
Alpena County	12	30,605	0.04
Arenac County	3	14,931	0.02
ROI Total	3,037	85,890	3.5

**Note:** Wurtsmith AFB personnel exclude dependents. Data with dependents were not available, but would be approximately three times the figures shown. Zip code data was provided from base personnel records. Zip code data were available for approximately 80 percent of base personnel; the remaining 20 percent were not available.

#### **Region of Influence**

##### **Economic Activity**

The extent of the socioeconomic effects of both closure and reuse of Wurtsmith AFB within the region depends on the degree of interindustry linkages within and among the businesses and firms located in the economic region. Based on the amount of trade among regional sectors, these linkages determine the nature and magnitude of the multiplier effect of proposed actions at the base. Wurtsmith AFB is located within a region which has a relatively small economic base compared to other parts of the nation. Therefore, the base's influence on the ROI economy is relatively great. The secondary (or multiplier) effects, determined by economic interactions and linkages within the region, would be less than for more densely populated parts of the nation. Although this indicates that there would likely be additional socioeconomic effects outside the four-county region, because of the linkage of industries in the region with those outside the region, the interaction with industries outside the region is so dispersed that the effects in other regions of Michigan and of the United States would be minimal.

Most demands associated with regional economic effects of base closure and potential reuse activities at the site are anticipated to be concentrated

within the counties of Alcona, Alpena, Arenac, and Iosco. Potential indirect effects in counties outside this ROI are outside the scope of this analysis and are expected to be small compared to the total level of economic activity of the counties.

### Population

The population effects of closure and potential reuse of Wurtsmith AFB were analyzed at both regional and local levels. Population effects were further allocated based upon the likely residency patterns of personnel associated with each reuse alternative and the communities most affected by base closure. The ROI consisted of Alcona, Alpena, Arenac, and Iosco counties and Oscoda, Au Sable, and Greenbush townships. Over 92 percent of April 1992 Wurtsmith AFB military and civilian personnel reside in these communities. The remaining personnel were widely scattered among other communities in the four-county region, and represent a negligible portion of the population in these areas.

### Housing

Housing effects resulting from closure and reuse of Wurtsmith AFB were analyzed at both regional and local levels. Housing effects are expected to follow the distribution of population effects as discussed above. Thus the ROI is the same for housing issues as it is for population issues: Alcona, Alpena, Arenac, and Iosco counties and Oscoda, Au Sable, and Greenbush townships.

### Public Services

The public service analysis focused on the principal jurisdictions likely to be most affected by base closure and reuse, including those that provide services directly to Wurtsmith AFB military and civilian personnel or their dependents, and those that have public service and facility arrangements with the base. These jurisdictions include Iosco and Alcona county governments; Oscoda, Au Sable, and Greenbush township governments; and Oscoda Area Schools (serving Oscoda, Au Sable, and Greenbush) and Tawas Area Schools (serving East Tawas and Tawas). Component police departments and fire protection agencies, including the units of the Oscoda Township and Alcona County governments responsible for providing services under contract to area residents, also are included.

### Public Finance

The public finance analysis addressed the fiscal implications of public service changes caused by base closure and reuse. The public finance ROI includes the jurisdictions comprising the public service ROI: Iosco and

Alcona county governments; Oscoda, Au Sable, and Greenbush township governments; Oscoda Area Schools; and Tawas Area Schools.

### Transportation

The ROI for the transportation analysis included Oscoda and Au Sable townships with emphasis on the immediate area surrounding Wurtsmith AFB. Within this geographic area, the analysis covers the existing principal road and rail transportation networks, including those segments of the transportation networks in the region that serve as direct or indirect linkages to the base, and those that would be affected during reuse, including those used by Wurtsmith AFB personnel.

### Utilities

The ROI for assessing utility systems consisted of the service areas of each utility purveyor servicing the communities most affected by the closure and reuse of Wurtsmith AFB. The ROI included Oscoda and Au Sable townships and other adjacent portions of Iosco County. Other affected areas, including Greenbush Township, have small or widely dispersed populations and represent a very small portion of the utility providers' customers. Therefore, they were not included in the ROI for the utilities analysis.

### Methods

#### Economic Activity

The economic activity analysis concentrated first on estimating ROI-level effects on employment and worker out-migration and in-migration, and then allocating these effects to areas (counties and townships) within the ROI.

Analysis of socioeconomic effects utilized total output, employment, and earnings multipliers for the ROI, obtained from the U.S. Bureau of Economic Analysis (BEA) Regional Input/Output Modeling System (RIMS II). Interindustry multipliers were prepared by the BEA using the United States input-output table in combination with the most recent region-specific information describing the relationship of the regional economy to the national economy. The BEA's RIMS II model is based on research by Cartwright, et al. (1981).

The same basic methodology was used to develop quantitative projections of economic activity for closure conditions, the Proposed Action, and the other reuse alternatives. This methodology was developed to follow economic impact assessment procedures and principles suggested by the BEA (Beemiller, et al., 1986; Cartwright and Beemiller, 1980). Changes in regional demand in each local industrial and household sector were first estimated as follows:

- For preclosure and closure conditions, demands from residual base operations and caretaker activities were estimated from employment, payroll, and contract data published in *Economic Resource Impact Statements* for Wurtsmith AFB.
- Reuse construction-phase demands were estimated using cost data published by R.S. Means Company, Inc., parameters developed in the support of the Description of Proposed Action and Alternatives (DOPAA), and RIMS II labor and material coefficients. Operations phase demands were estimated from land use jobs planning factors and regional output-per-job estimates derived from RIMS II coefficients.

These primary or direct effects were then multiplied, using RIMS II coefficients specific to the regional economy, to provide estimated total spending associated with the reuse alternatives. Input-output sectors were selected to reflect the anticipated spending profiles associated with the Proposed Action and alternatives in order to make a reasonable estimate of the general magnitude of the economic characteristics of the Proposed Action and alternatives within the ROI. The sectors used in the analysis are listed in Table B-3.

The number of in-migrant workers associated with each alternative and out-migrant workers associated with phase-down of base operations was estimated according to a set of proportional assumptions. The percentages were extrapolated from assumptions developed by Spiegel and Hewings (1989) for a study of the closure of Chanute AFB in Rantoul, Illinois. Supplemental information was available from a survey of Oscoda residents in 1990 (An Advisory Committee of Oscoda Residents, 1990).

All military personnel would leave the area when the base closes. Some retired military personnel are likely to out-migrate due to loss of services customarily provided by the base.

Many civil service employees are in skilled positions, which increases the likelihood of migration from the area. Nonappropriated fund employees are typically in less-skilled positions, employed in support functions such as recreation and commissary sales, and are less likely to out-migrate. Contract employees generally are employed under service contracts at the base, such as housing area maintenance. Many of these workers are in craft positions of varying skill levels, and are less likely to out-migrate. Secondary workers would be employed principally in retail and service jobs, and would be less likely to out-migrate. Out-migration assumptions and base closure calculations illustrating their use are presented in Table B-4.

The calculation of out-migrating workers and dependents presented in Table B-4 was based on the effects of closing the base. Site-related workers plus retirees are presented by labor category for the preclosure year



Table B-3. Input-Output Sectors Used in Wurtsmith AFB Closure and Reuse Analysis  
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I-O Sectors and Aggregated I-O Sectors		Historic		Fire		Recreation Alternative	No-Action Alternative
		Base Operations	Proposed Action	Training Alternative			
4.0002	Landscape and horticultural services		X	X		X	
11.0201	New construction: Industrial buildings			X			
11.0202	New construction: Office buildings			X		X	
11.0205	New construction: Stores and restaurants			X		X	
11.0207	New construction: Education buildings			X			
11.0241	New construction: Amusement and recreation buildings					X	
11.0301	New construction: Telephone and telegraph facilities		X	X		X	
11.0303	New construction: Electric utility facilities		X	X		X	
11.0304	New construction: Gas utility facilities		X	X		X	
11.0306	New construction: Water supply facilities		X	X		X	
11.0307	New construction: Sewer system facilities		X	X		X	
11.0400	New construction: Highways and streets		X	X		X	
12.0100	M&R construction: Nonfarm residential structures	X	X	X		X	
12.0201	M&R construction: Other nonfarm buildings		X	X		X	X
12.0212	M&R construction: Military facilities	X					
56.0100	Radio and TV receiving sets	X					
56.0200	Phonograph records and tapes	X					
56.0300	Telephone and telegraph apparatus	X					
56.0400	Radio and TV communication equipment	X					X
65.0200	Local, suburban transit and interurban highway passenger transportation	X					
65.0300	Motor freight transportation and warehousing	X	X	X		X	
65.0500	Air transportation		X	X		X	
66.0000	Communications, except radio and TV	X					
68.0100	Electric services (utilities)	X					X

Wurtsmith AFB Disposal and Reuse SIAS

Table B-3. Input-Output Sectors Used in Wurtsmith AFB Closure and Reuse Analysis  
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I-O Sectors and Aggregated I-O Sectors	Historic		Fire		No-Action Alternative
	Base Operations	Proposed Action	Training Alternative	Recreation Alternative	
68.0200 Gas production and distribution (utilities)	X				X
68.0301 Water supply and sewerage systems	X				X
68.0302 Sanitary services, steam supply, and irrigation systems	X				X
69.0100 Wholesale trade	X				X
69.0200 Retail trade	X	X	X	X	X
72.0100 Hotels and lodging places	X	X	X		X
72.0201 Laundry, cleaning, garment services, and shoe repair	X				X
72.0204 Electrical repair shops	X				X
73.0101 Miscellaneous repair shops	X				X
73.0102 Services to dwellings and other buildings	X				X
73.0103 Personnel supply services	X				
73.0104 Computer and data processing services	X				
73.0107 Equipment rental and leasing services	X				X
73.0108 Photofinishing labs, photocopy, and commercial photography	X				X
73.0109 Other business services	X				
74.0000 Eating and drinking places	X				X
75.0002 Automotive repair shops and services	X				X
76.0206 Other amusement and recreation services			X	X	
77.0401 Elementary and secondary schools	X		X	X	
77.0402 Colleges, universities, and professional schools		X	X	X	
91.0000 Personal consumption expenditures	X				X
AS #8 Manufacturing: Food and kindred products and tobacco		X	X	X	
AS #9 Manufacturing: Textile mill products	X	X	X	X	
AS #10 Manufacturing: Apparel		X	X	X	

Wurtsmith AFB Disposal and Reuse SIAS

Table B-3. Input-Output Sectors Used in Wurtsmith AFB Closure and Reuse Analysis  
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I-O Sectors and Aggregated I-O Sectors	Historic		Fire		Recreation Alternative	No-Action Alternative
	Base Operations	Proposed Action	Training Alternative			
AS #11	X	X	X		X	
AS #12		X	X		X	
AS #13		X	X		X	
AS #14		X	X		X	
AS #15		X	X		X	
AS #16		X	X		X	
AS #17		X	X		X	
AS #18		X	X		X	
AS #19		X	X		X	
AS #20		X	X		X	
AS #21		X	X		X	
AS #22		X	X		X	
AS #23		X	X		X	
AS #24		X	X		X	
AS #35		X	X		X	
AS #37	X	X	X		X	

AS = Aggregated I-O Sector.

IO = Input-Output.

M&R = Maintenance and repair.

Sources: U.S. Bureau of Economic Analysis, 1992.

Wurtsmith AFB Disposal and Reuse SIAS

**Table B-4. Out-Migrating Workers and Population by Employment Category, 1990**

Employment Category	Site-Related Employment and Retirees	Percent Relocating from Region	Out-Migrating Employees	Household Size	Out-Migrating Population
Military	3,062	100.0	3,062	2.38 <sup>(a)</sup>	7,274
Civilian <sup>(b)</sup>	4,248	19.7	835	2.49	2,080
Civil service	436	60.0	262	2.91	762
Nonappropriated fund <sup>(c)</sup>	291	10.0	29	2.91	84
Contract	180	10.0	18	2.91	52
Secondary	1,421	10.0	142	2.91	414
Retired military	1,920	20.0	384	2.00	768
Total	7,310	53.3	3,897	2.40 <sup>(d)</sup>	9,354

Notes: (a) Military out-migrating population of 7,274 reported in U.S. Air Force, 1991. Household size of 2.3756 calculated for presentation here.

(b) Civil service are appropriated fund employees.

(c) Includes private business on-base employment.

(d) Weighted average.

Sources: Spiegel and Hewings, 1989; U.S. Air Force, 1990c; U.S. Bureau of the Census, 1987b; and calculations performed for this study.

of 1990. The percentage of workers expected to move out of the ROI ranged from 10 to 100 percent, depending on the type of personnel. Out-migrating employees were calculated by multiplying the number of personnel times the assumed relocation percentage in that job category. The number of out-migrating employees times the average household size in that category determined the out-migrating population. As the number of base operations personnel declines to zero by 1993, all out-migrating employees and dependents were projected to leave the area. This analysis projects that 53.3 percent of all site-related employees and retired military personnel will move out of the ROI with closure of the base. This percentage is the weighted average of 100.0 percent of all out-migrating military and 19.7 percent of all civilian workers plus retirees moving out of the ROI.

In-migration assumptions are related to the out-migration assumptions. No jobs were projected to be filled 100 percent by in-migrating workers, since this would imply that no persons with the necessary skills were available in the ROI to perform these jobs. Direct on-site operations jobs were assumed to require skill levels similar to those of civil service personnel. Construction workers were expected to be readily available in the area, though supervisory and highly skilled craft workers would likely in-migrate from outside the ROI. Relatively few secondary workers would move into the ROI, due to availability of suitable workers in the local labor force. In-migration assumptions and calculations for the Proposed Action in 2013 are presented in Table B-5.

**Table B-5. In-Migrating Workers and Population by Employment Category, Proposed Action, 2013**

Employment Category	Site-Related Employment	Percent		Household Size	In-Migrating Population
		Relocating to Region	In-Migrating Employees		
Direct operations	4,316	50.0	2,158	2.91	6,280
Construction	19	20.0	4	2.91	12
Secondary	2,593	10.0	259	2.91	754
Total	6,928	34.9	2,421	2.91	7,046

**Note:** Data in this table exclude projected natural increase of 1,346 persons from closure to 2013. Total migratory population effect in 2013 is 8,392 persons.

**Sources:** U.S. Bureau of the Census, 1987b; calculations performed for this study.

Average household size assumptions were specific to each type of employment, including direct and secondary jobs by category. Most civilian households were assumed to correspond with the average size of state-to-state migrating families (2.91 persons per household) between 1980 and 1985 (U.S. Bureau of the Census, 1987). For out-migrating military families, the number of personnel and dependents was based on Wurtsmith AFB personnel records. For retired military personnel, the average household size was assumed to be 2.00 persons.

The calculations presented in Table B-5 indicate the nature of the analysis performed for the worker and population in-migration effects of reuse. Site-related employment by category was projected for each year of the analysis. Worker in-migration assumptions were then applied to these job projections. The resulting figures represented the number of workers who would be in the ROI in that year, for that employment category, under that alternative, who would not have been in the ROI without the Proposed Action. This number of workers, when multiplied by average household size for that worker category, determined the number of persons in the ROI in that year who would not have been there without the Proposed Action. An average of 34.9 percent of all workers holding site-related jobs who would not otherwise live there was projected to live in the ROI with the Proposed Action. These persons may move into the ROI to take a site-related job, or refrain from moving out of the ROI due to availability of site-related employment. The data in Table B-5 exclude the effects of natural increase in population, which are discussed under population methods below.

Out-migration and in-migration were assumed to occur during the same year in which the associated job changes took place. Retirees leaving the area were assumed to out-migrate upon closure of the base.

The assumptions made in Tables B-4 and B-5 were based on prior Air Force base closure and reuse socioeconomic studies, and thus judged to be the most likely values applicable to the reuse alternatives in this study. Other assumptions could result in either higher or lower population effects than

those resulting from the assumptions specified. Such an outcome is possible, but its likelihood is quite difficult to assess.

After determining the in-migrating and out-migrating workers, the next step in the analysis was to allocate or assign the ROI effects on in-migrating and out-migrating workers to areas (counties and townships) within the ROI. This was done using the data presented in Tables B-1 and B-2 and as discussed above in the definition of the ROIs for this study. This intraregional allocation analysis separately accounted for the distribution of direct and secondary workers and their families among the various residential areas within the region.

The relative attractiveness of residential areas was estimated from Wurtsmith AFB personnel files of civilian workers (see Table B-1). The residential choices of Wurtsmith AFB civilian workers in 1992 were anticipated to coincide with the residential choices of direct in-migrants to the area. This assumption was based on the expectation that the attractiveness of each residential location, including attributes such as adequate public and commercial services and proximity to work location, would best be measured by the revealed preference of base civilian workers.

Table B-6 shows the percentages of out-migrating or in-migrating workers (military personnel, other direct workers, and secondary workers) allocated from or to each local area (township and counties). These spatial allocation percentages were calculated from the 80-percent sample of base residential data and 1990 area population data presented in Tables B-1 and B-2. Military out-migrants (first column of Table B-6) were projected to move off the base and from areas around the base. Direct civilian base employees (second column of table) were projected to move out of the areas around the base in proportion to their known pattern of residence. Secondary employees leaving the area, whose jobs were dependent on spending of direct military and civilian employees (third column of table) were projected to out-migrate from areas around the base in the same spatial proportions as direct civilian workers. Secondary workers leaving the area whose jobs depended on the purchase of goods and services by the base (fourth column of table) were projected to out-migrate in proportion to the overall 1990 pattern of off-base population settlement in the ROI. This fourth column of data was calculated from the area population data presented in Table B-2, excluding the on-base resident population.

Workers moving into the ROI to take site-related jobs under the Proposed Action and alternatives were spatially allocated to areas within the ROI using the same proportionate distributions as out-migration. Direct workers and secondary workers dependent on direct worker spending were assigned based on the 1992 residential distribution of direct civilian workers at the base. Secondary workers dependent on goods and services purchased by

**Table B-6. Intra-ROI Distribution of Out-Migrant Workers Related to Wurtsmith AFB**

County and Township	Military (percent)	Civilian Direct (percent)	Civilian Secondary	
			Worker Spending	Goods and Services
Iosco County	95.9	63.3	63.3	31.1
Oscoda Township	86.4	38.8	38.8	8.5
Au Sable Township	7.4	14.2	14.2	2.9
Rest of County	2.1	10.3	10.3	19.7
Alcona County	4.0	32.8	32.8	12.6
Greenbush Township	2.4	10.1	10.1	1.7
Rest of County	1.6	22.7	22.7	10.9
Alpena County	0.0	3.6	3.6	37.8
Arenac County	0.1	0.3	0.3	18.5
ROI Total	100.0	100.0	100.0	100.0

Sources: U.S. Air Force, 1992a; U.S. Bureau of the Census, 1991a.

establishments on the site were allocated within the ROI on the basis of the 1990 off-base ROI population distribution.

#### Population

Population changes, associated with preclosure and post-closure without reuse, the Proposed Action, and all reuse alternatives, are an important determinant of other socioeconomic and environmental effects. These population changes have three key components: (1) baseline growth, (2) relocation of workers and their dependents, and (3) natural increase (births minus deaths) over the long term.

Population trends for the ROI were prepared by the Michigan Department of Management and Budget, Office of Tax and Revenue Analysis for each ROI county. These projections were made in 1985 and therefore assumed continued operation of Wurtsmith AFB within the ROI. The forecasts were adjusted to reflect 1990 census counts and the effects of base closure by subtracting the estimated population loss expected with closure of the base.

The relocation of workers in response to base closure and subsequent reuse was determined utilizing the methods and assumptions discussed under economic activity. The number of dependents expected to relocate with these workers was estimated based on household size parameters derived from census demographic data and Wurtsmith AFB personnel records (see Tables B-4 and B-5).

The natural increase in population was calculated using demographic data reported for Iosco and Arenac counties by Frahm (1991), drawing on prior population studies of the region. The data indicate a natural increase (resulting from births in excess of deaths) in the counties of 18 percent between 1970 and 1988, equivalent to approximately a 20-percent gain over a 20-year period. This natural population trend is expected to continue for the 20-year period beginning at base closure.

To evaluate anticipated population effects, potential future changes associated with each reuse scenario were compared graphically and numerically to changes projected without reuse and to changes that occurred prior to base closure. Population changes in Oscoda, Au Sable, and Greenbush townships received primary emphasis in this analysis.

### Housing

The population changes associated with closure and reuse would result in further changes in housing demand. Only the off-base portion of the out-migrating population is used for estimating the closure housing demand changes. Housing demand effects of closure and reuse were estimated from migration projected for the Proposed Action and alternatives, assuming one in-migrating household per 2.91 in-migrating persons. Each in-migrating household would require one unit and each out-migrating household would relinquish one unit.

Expected housing availability was considered for the ROI and key communities based on recent housing construction and vacancy trends. Projections based on the reuse plan for Wurtsmith AFB housing units were used to evaluate housing availability. Projected housing demand for the ROI, including Oscoda, Au Sable, and Greenbush townships, for the Proposed Action and each alternative, was then compared with the No-Action Alternative to assess the effect of reuse on local housing conditions.

### Public Services

Potential effects on local public services due to changes in demand associated with closure and reuse of Wurtsmith AFB were determined for the region's key public services: general government, public education, police protection, fire protection, and health care.

Several key assumptions regarding future jurisdictional control of base property were made in determining the effects on public services. These assumptions also apply to assessment of effects on public finance. Under the No-Action Alternative, ownership of Air Force-owned property remains with the U.S. government, and OL activities include provision of security and maintenance of on-site facilities. Under the Proposed Action and alternatives, ownership would pass eventually to private organizations and



state and local government entities. Local governments would be responsible for providing needed public services.

The methods used to analyze public service and public finance effects of closure and reuse of the base combine elements of the per-capita multiplier, case study, and service standard approaches, adapted from Burchell and Listokin (1978).

The levels of general public service were determined considering the size of the population of each jurisdiction (county, township, school district); the land area; the jurisdiction's type of service; and, in some instances, the minimum level of service needed to maintain government functions. Greatest emphasis was placed on the population served, using ratios of employees (e.g., municipal employees, sworn officers, professional fire fighters) to population served and student/teacher ratios at the primary and secondary public school levels. Level-of-service ratios were determined for each affected jurisdiction by comparing the actual service levels for 1992 and the actual off-base population for 1990 (the most recent available). Off-base population was computed by subtracting the Wurtsmith AFB census designated place population from the ROI 1990 population (U.S. Bureau of the Census, 1991a). The 1990 actual population is very close to the 1992 population estimates prepared for this study; however, the actual service levels for 1990 were not readily available from the jurisdictions. County government staffing changes were determined by county population changes. Township and school district staffing changes were determined by changes in the respective populations.

No recognized national or state standard for staffing levels exists and such levels usually reflect the experienced needs of the community. Staffing level ratios for police and fire protection (employees per 1,000 population) differed among the jurisdictions analyzed for this study. The data were compared to computed ratios of personnel to population compiled from nationally recognized sources (International City Management Association, 1992; U.S. Federal Bureau of Investigation, 1992). The police ratios computed for this study were lower than the averages for jurisdictions of comparable size, while the fire protection ratios were higher, reflecting the volunteer nature of the two local fire departments.

These service ratios were used to estimate jurisdiction-specific future requirements for services, assuming that local governments would exercise flexibility in providing services to accommodate changes in area population. For example, schools may choose to close facilities or combine classes in response to lower enrollments and lower funding levels; police and sheriff departments may reassign officers if reduced area population results in staff cuts; and general government functions may be performed with more part-time or on-call personnel and fewer full-time employees.

Ratios of employees to jurisdiction land area or developed land area were used to calculate requirements for personnel based on the additional on-base land area to be served. General government effects to smaller jurisdictions were analyzed qualitatively, as for Au Sable and Greenbush townships, which use part-time, paid-for-service employees to provide at least the minimum adequate level of service.

Projected changes in public school enrollments were estimated based upon the results of the population analysis. The number of future public school instructors that would be required was based on enrollment projections and existing student/teacher ratios. The number of future public-sector employees needed to meet future demand and maintain existing levels of service for other public services was determined using projected population changes and existing level-of-service ratios.

Finally, the analysis examined the geographical distribution of potential effects. Because of the magnitude of some effects of closure and reuse, past level-of-service ratios may not adequately meet new service requirements. Changes in land area served and types of services to be provided were considered. Discussions with staff at key local agencies were used to assess these particular factors.

Estimated changes in requirements are presented in this analysis to measure the effects of the alternatives. Responses of local governments to base closure and reuse may vary depending on specific circumstances.

#### Public Finance

Local jurisdiction finances were evaluated based on changes in historic revenues and expenditure levels, changes in fund balances, and reserve bonding capacities. The analysis concentrated on each jurisdiction's governmental funds (general fund, special revenue funds, and, as applicable, capital projects and debt service funds). Other funds, such as enterprise funds which are funded principally through user charges without contributing to the general tax burden of area residents, have not been included in the analysis.

Post-closure conditions (assuming closure and caretaker status of Wurtsmith AFB) and effects of the Proposed Action and alternatives (assuming base reuse) were determined by:

- Population increases (or decreases) in each jurisdiction, including school districts

- Potential changes in each jurisdiction's property tax base
- Changes in federal transfers due to closure of the base, particularly losses of Public Law 81-874 funds.

Revenue effects were estimated for both the tax and non-tax-revenue sources of each jurisdiction. Changes in tax revenue were estimated for the major types of taxes collected by the local jurisdiction based on the change in the tax base resulting from closure or reuse (e.g., changes in assessed valuation) and the effective tax rate associated with that tax source (e.g., the property tax rate applicable to each jurisdiction). Non-tax-revenue effects, such as changes in service charges, intergovernmental transfers, fines, fees, and miscellaneous revenues, were estimated on a per-capita basis.

Per-capita rates for the revenue sources, assumed to change in response to changing population levels, were calculated using FY 1989 values for each revenue source analyzed in each jurisdiction and the estimated population in each jurisdiction for that year. Receipts for each revenue source in each jurisdiction were divided by the estimated population in that jurisdiction for that year.

Some revenue sources were not expected to respond to changes in population, and were treated differently from sources which would respond to population changes. In particular, miscellaneous revenues include interest earnings which would not be affected by changing population levels. Exact portions of miscellaneous revenues attributable to interest earnings were not known for every jurisdiction. Per-capita miscellaneous revenue rates were, therefore, reduced by 50 percent to account for the expected lack of change in interest revenues.

Expenditure effects also were estimated based on the historic (FY 1989) per-capita costs of the principally affected service functions of each jurisdiction. These functions include law enforcement, fire protection, recreation, and others. Per-capita costs were multiplied by the estimated change in the population base of each jurisdiction.

Certain functions, such as general government administration, were assumed to exhibit some economies of scale. For example, although base closure is expected to reduce the population in Oscoda Township by approximately 50 percent, it is unlikely there will be a corresponding reduction in expenses for the township trustees and clerk. Increases in population caused by reuse of the base likewise are not expected to cause corresponding increases in expenses for these activities. Although the exact future response by each jurisdiction is unknown, per-capita rates for these functions were reduced by 10 percent of their baseline values to account for this effect.

In a similar manner, expenditures for police and fire protection also may not be reduced in direct proportion to population reductions caused by closure of the base. There would be a need to continue such activities as street patrol at minimally adequate levels. While reductions in staffing, salary, and benefit costs could occur, expenditure reductions for public safety could be a combination of layoffs, reduced hours, and cutbacks in travel, equipment replacement, and training. Although the exact future response of each jurisdiction when faced with revenue shortfalls is unknown, per-capita rates for public safety functions were reduced to one-half of their baseline rates to account for these minimal requirements.

Any potential increases in per-capita costs due to additional land area served, independent of changes in population, would be an addition to the expenditures projected in this study.

Net fiscal effects, or shortfalls, are based on the projected increase (or decrease) in revenues minus the projected increase (or decrease) in expenditures.

#### Transportation

The transportation network of the ROI was examined to identify potential effects to levels of service (LOS) arising from closure conditions (caretaker status of Wurtsmith AFB) and effects of the Proposed Action and alternatives. Changes in traffic volumes and peak-hour LOS ratings were projected for road segments (excluding highway ramps) rounded to the nearest hundred. LOS ratings were based on *Highway Capacity Manual* recommendations (Transportation Research Board, 1985).

Impacts of roads in the ROI were measured in terms of the changes in the number of vehicles traversing uniform sections of roadway. These changes would arise from closure conditions (caretaker status of Wurtsmith AFB) or from effects of alternative reuse plans. To measure these changes, traffic volumes (including projected reuse-related traffic) were compared to the capacity of the road segment and determined as a ratio (known as volume-to-capacity ratio). The capacity of a roadway is defined as the maximum hourly rate at which vehicles can pass a uniform section of a roadway under prevailing roadway, traffic, and control conditions. The 1985 *Highway Capacity Manual* provides the methodology for determining capacity. Traffic volumes typically are reported as either the daily number of vehicular movements in both directions on a segment of roadway averaged over a full calendar year (average annual daily traffic, [AADT]) and/or the number of vehicular movements on a road segment during the average peak hour. The average peak hour volume for urban areas typically is about 10 percent of the AADT (Transportation Research Board, 1985). These values are useful indicators in determining the extent to which the roadway segment is used and in assessing the potential for congestion and other problems.

Traffic flow conditions are generally reported in terms of LOS, rating factors that represent the general freedom (or restriction) of movement on roadways (Table B-7). The LOS scale ranges from A to F, with low-volume, high-speed, free-flowing conditions classified as LOS A. LOS E is representative of conditions that, although not favorable from the point of view of the motorist, provide the greatest traffic volume per hour. With minor interruptions, however, LOS E will deteriorate to LOS F (Transportation Research Board, 1985).

**Table B-7. Levels of Service (LOS) for Basic Roadway Sections**

LOS	Description	Criteria (Volume/Capacity)		
		Freeway <sup>(a)</sup>	4-lane Highway <sup>(b)</sup>	2-Lane Highway <sup>(c)</sup>
A	Free flow with users unaffected by presence of other users of roadway	0-0.35	0-0.28	0-0.10
B	Stable flow, but presence of other users in traffic stream becomes noticeable	0.36-0.54	0.29-0.45	0.11-0.23
C	Stable flow, but operation of single users becomes affected by interactions with others in traffic stream	0.55-0.77	0.46-0.60	0.24-0.39
D	High density, but stable flow; speed and freedom of movement are severely restricted; poor level of comfort and convenience	0.78-0.93	0.61-0.76	0.40-0.57
E	Unstable flow; operating conditions near capacity with reduced speeds, maneuvering difficulty, and extremely poor levels of comfort and convenience	0.94-1.00	0.77-1.00	0.58-0.94
F	Forced or breakdown flow with traffic demand exceeding capacity; unstable stop-and-go traffic	1.00	1.00	0.94-1.00

Notes: (a) Table 3-1, Levels of Service for Basic Freeway Section, Highway Capacity Manual, Transportation Research Board, 1985.  
 (b) Table 7-1, Levels of Service Criteria for Multilane Highways, 4-lane arterial, 50 mph Design Speed, Highway Capacity Manual, Transportation Research Board, 1985.  
 (c) Table 8-1, Level of Service Criteria for General 2-lane Highway Segments, Rolling Terrain, 20 per car no passing zones, Highway Capacity Manual, Transportation Research Board, 1985.

Source: Transportation Research Board, 1985.

LOS ratings presented in this study, as depicted in Table B-7, were determined by the ratio of volume to capacity for peak-hour traffic. The types of facilities were classified as: two-lane highway, multi-lane highway (typically four through lanes in urban or suburban settings, no controlled access, and may represent urban arterial segments), and freeway, to account for the possibility of upgrading some state or county roads.

*Highway Capacity Manual* data were selected as most appropriate to the study area.

Traffic volumes for the study area were derived from the AADT counts provided by the Michigan Department of Transportation, the Iosco County Road Commission, previous studies, and short period counts at some intersections in the vicinity of the base. Changes in trip generation arising from reuse alternatives at Wurtsmith AFB were estimated (see Institute of Transportation Engineers, 1991b), and resulting volume changes on key road segments were determined (see Institute of Transportation Engineers, 1990).

Given the recreational character of the area, seasonal factors obtained from the Michigan Department of Transportation were applied to AADT and the analysis was performed for the peak month (July), considered the most critical period. Resulting changes in peak-hour LOS ratings were then determined. Changes in work and associated travel patterns were derived by assigning or removing workers (by place of residence) to or from the most direct commuting routes. Those portions of the transportation system on which conditions were projected to decline to LOS F were assumed to be upgraded to support LOS E. These improvements were assumed to be part of the reuse alternative under analysis.

Changes in demand for rail freight and passenger service, arising from closure and reuse of the base, were determined from data developed for each alternative. Actions at Wurtsmith AFB would have little effect on AMTRAK ridership, since the nearest station is at Flint, Michigan, more than 100 miles from the base.

Additional information on methods used in the transportation analysis is presented in Appendix E of the *Environmental Impact Statement for Disposal and Reuse of Wurtsmith AFB, Michigan*.

#### Utilities

The utility systems addressed in this analysis include the facilities and infrastructure used for:

- Potable water pumping, treatment, storage, and distribution
- Wastewater collection and treatment
- Solid waste collection and disposal
- Energy generation and distribution, including the provision of electricity, natural gas, coal, and fuel oil.

For the reuse alternatives, local purveyors of potable water, wastewater treatment, and energy were anticipated to provide services within the area of the existing base, and these entities could acquire most or all related on-base utilities infrastructure and distribution equipment. It was also assumed that reuse activities would generate solid wastes that could be disposed in area landfills.

Long-term projections of population and demand were obtained from the various utility purveyors within the ROI for each of their respective service areas. These projections were adjusted to reflect the decrease in demand associated with closure of Wurtsmith AFB and its subsequent operation under caretaker status. These adjusted forecasts were then considered the baseline for comparison with potential reuse alternatives.

The potential effects of reuse alternatives were evaluated by estimating and comparing the additional direct and indirect demand associated with each alternative to the existing and projected operating capabilities of each utility system. All changes to the utility purveyors' long-term forecasts were based on estimated population changes in the ROI and the future rates of per-capita demand implicitly or explicitly indicated by each purveyor's projections. Projections in the utilities analysis include demand for water, wastewater treatment, solid waste disposal, electricity, and natural gas, both on the site of Wurtsmith AFB from activities planned under the Proposed Action and alternatives, as well as resulting changes in domestic demand associated with direct and indirect population changes in the ROI.

A detailed description of methods used for the utilities analysis is found in Appendix E of the *Environmental Impact Statement for Disposal and Reuse of Wurtsmith AFB, Michigan*.

## **APPENDIX C**

### **GLOSSARY OF TERMS AND ACRONYMS/ABBREVIATIONS**

#### **GLOSSARY OF TERMS**

**Arterial.** Signalized street that serves primarily through-traffic and provides access to abutting properties as a secondary function.

**Average Annual Daily Traffic (AADT).** For a 1-year period, the total volume passing a point or segment of a highway in both directions, divided by the number of days in the year.

**Average Travel Speed.** The average speed of a traffic stream computed as the length of a highway segment divided by the average travel times of vehicles traversing the segment, in miles per hour.

**Biophysical.** Pertaining to the physical and biological environment, including the environmental conditions crafted by man.

**Capacity (transportation).** The maximum rate of flow at which vehicles can reasonably be expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions.

**Capacity (utilities).** The maximum load a system is capable of carrying under existing service conditions.

**Civilian Health and Medical Program of the Uniformed Services (CHAMPUS).** A co-payment medical plan, providing for specific medical services to retired military and to eligible dependents of active, retired, or deceased military personnel.

**Commercial Aviation.** Aircraft activity licensed by state or federal authority to transport passengers and/or cargo for hire on a scheduled or nonscheduled basis.

**Constant 1989 Dollars.** The transformation of current dollars into 1989 dollars using an appropriate deflator index to eliminate the effects of inflation and allow for comparability over time.

**Effects (Impacts).** An assessment of the meaning of changes in all attributes being studied for a given resource; an aggregation of all the effects, usually measured using a qualitative and nominally subjective technique. In environmental impact statements, as well as in the Council on Environmental Quality regulations, the word impact is used synonymously with the word effect.

**Employment.** The total number of full- and part-time jobs held by wage and salary workers, both civilian and military, as well as farm and nonfarm proprietors.

**Enterprise Fund.** One of the proprietary fund types used to account for activities which are financed primarily through user charges.

**Environmental Impact Analysis Process.** The process of conducting environmental studies as outlined in Air Force Regulation 19-2.



**Environmental Protection Agency (EPA).** The independent federal agency, established in 1970, that regulates federal environmental matters and oversees the implementation of federal environmental laws.

**Fiscal Year.** An accounting period of 12 months. Federal fiscal year is October 1 through September 30. Local and state government fiscal years vary from jurisdiction to jurisdiction.

**General aviation.** All aircraft which are not commercial or military aircraft.

**Housing Stock.** The existing number of structural units intended primarily as a domicile (e.g., single-family attached, single-family detached, multi-family dwellings, mobile homes, etc.) and suitable for occupancy at a point in time, usually the beginning of the calendar year.

**Infrastructure.** The basic installations and facilities on which the continuance and growth of a locale depend (roads, schools, power plants, transportation, and communication systems, etc.).

**Interstate.** The designated National System of Interstate and Defense Highways located in both rural and urban areas; they connect the east and west coasts and extend from points on the Canadian border to various points on the Mexican border.

**Level of service (LOS).** In transportation analyses, a qualitative measure describing operational conditions within a traffic stream and how they are perceived by motorists and/or passengers. In public services, a measure describing the amount of public services (e.g., fire protection and law enforcement services) available to community residents, generally expressed as the number of personnel providing the services per 1,000 population.

**Migratory Effects.** Persons who would leave the ROI or move into the ROI as a result of closure or reuse of an Air Force base, due to changes in employment, and its effects on population, housing, public services, public finance, transportation, and utilities.

**Mill.** One-tenth of a cent.

**Mitigation.** A method or action to reduce or eliminate program impacts.

**Multiple Family Housing.** Townhouse or apartment units that accommodate more than one family though each dwelling unit is only occupied by one household.

**National Environmental Policy Act (NEPA).** Public Law 91-190, passed by Congress in 1969. The Act established a national policy designed to encourage consideration of the influences of human activities (e.g., population growth, high-density urbanization, industrial development) on the natural environment. NEPA also established the Council on Environmental Quality. NEPA procedures require that environmental information be made available to the public before decisions are made. Information contained in NEPA documents must focus on the relevant issues in order to facilitate the decision-making process.

**Operation Location (OL).** An organizational element of the Air Force Base Disposal Agency located at a closing base. The OL is responsible for the care and custody of closed areas of the base, disposal of real and related personal property, and environmental cleanup. This office is the primary point of contact for local community reuse organizations and the general public who deal with the disposal and reuse of the base.

**Operations jobs.** Direct on-site employment created by the site development.

**P.L. 81-874.** A federal law which authorizes financial assistance for local school districts upon which the United States has placed financial burdens as the result of the acquisition of real property by the United States; a sudden and substantial increase in enrollment as the result of federal activities; or due to the need to provide education for children residing on federal property or whose parents are employed on federal property.

**Primary Roads.** A consolidated system of connected main roads important to regional, statewide, and interstate travel; they consist of rural arterial routes and their extensions into and through urban areas of 5,000 or more population.

**Rate of Growth.** The annual percentage change, compounded over a period of time.

**Section 3 Transition Entitlements.** Special impact aid program authorized under P.L. 81-874 for continued funding of federal impact aid to a local school district after the district becomes ineligible under general program guidelines. Provides authority for continued impact aid when a decrease or cessation of federal activities in an area results in a substantial decrease in the number of children eligible for such aid. Payments would be for a period of 3 years, in reduced amounts (90 percent of the previous year's entitlement), and are subject to Congressional appropriation.

**Shortfall.** The difference between projected local government expenditures and revenues when the projected expenditures are greater than projected revenues.

**Single-Family Housing.** A conventionally-built house consisting of a single dwelling unit occupied by one household.

**Site-Related.** Refers to direct base employees and secondary job holders (and their dependents); secondary jobs are created from direct base employee payroll spending and base expenditures for goods and services.

**Special Revenue Fund.** A fund which accounts for the proceeds of specific revenue sources that are legally restricted to expenditures for specified purposes.

**Therm.** A measurement of units of heat.

**Transfer.** Deliver title to another federal agency.

**U.S. Environmental Protection Agency (EPA).** The independent federal agency, established in 1970, that regulates federal environmental matters and oversees the implementation of federal environmental laws.

**Volume.** The number of vehicles passing a point on a lane, roadway, or other trafficway during some time interval.

## **ACRONYMS/ABBREVIATIONS**

<b>AADT</b>	<b>average annual daily traffic</b>
<b>ACC</b>	<b>Air Combat Command</b>
<b>AFB</b>	<b>Air Force Base</b>
<b>BEA</b>	<b>Bureau of Economic Analysis (federal)</b>
<b>CHAMPUS</b>	<b>Civilian Health and Medical Program of the Uniformed Services</b>
<b>CPCO</b>	<b>Consumers Power Company</b>
<b>DBCRA</b>	<b>Defense Base Closure and Realignment Act of 1990 (Public Law 101-S10, Title XXIX)</b>
<b>DOD</b>	<b>Department of Defense</b>
<b>EIS</b>	<b>Environmental Impact Statement</b>
<b>ERIS</b>	<b>Economic Resource Impact Statement</b>
<b>FTE</b>	<b>full-time equivalent</b>
<b>FY</b>	<b>fiscal year</b>
<b>gpm</b>	<b>gallons per minute</b>
<b>JP-4</b>	<b>jet fuel</b>
<b>kV</b>	<b>kilovolt</b>
<b>kVA</b>	<b>kilovolt amperes</b>
<b>LOS</b>	<b>level of service</b>
<b>MBTU</b>	<b>million British thermal unit</b>
<b>MGD</b>	<b>million gallons per day</b>
<b>MichCon</b>	<b>Michigan Consolidated Gas Company</b>
<b>MWH</b>	<b>megawatt-hours</b>
<b>NEPA</b>	<b>National Environmental Policy Act of 1969</b>
<b>OL</b>	<b>Operating Location</b>
<b>P.L.</b>	<b>Public Law</b>
<b>ROI</b>	<b>region of influence</b>
<b>SIAS</b>	<b>Socioeconomic Impact Analysis Study</b>
<b>VA</b>	<b>Veterans Administration</b>
<b>WAEAC</b>	<b>Wurtsmith Area Economic Adjustment Commission</b>
<b>WSA</b>	<b>Weapons Storage Area</b>
<b>WWTP</b>	<b>wastewater treatment plant</b>